THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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NEWSPAPER

IBM casts lure to VSE users

Rolls out migration aid with MVS/XA upgrade

By Charles Babcock

WHITE PLAINS, N.Y. — Moving to relieve performance constraints of MVS/XA, IBM last week announced a second version of its main production system and a conversion package aimed at easing migration from DOS/VSE.

Previously, DOS/VSE users had been forced to run MVS/XA as a guest under IBM's VM/XA while converting their programs and to pay license fees for both operating systems during the process. The package automates much of the conversion, IBM officials said.

MVS/XA has crossed the halfway mark in user sites. **Page 13**

"The VSE conversion system is more significant than the Version 2.2 of MVS/XA," said Bonnie A. Digrius, director of software market research at Input, Inc., a Mountain View, Calif., market research firm.

"Under VM, the programs just run concurrently, but the changes still have to be done manually. This system changes the program instructions so they will run under MVS/XA," she added.

IBM is interested in converting as many of its DOS/VSE customers to MVS/XA as possible. Conversion to XA from both the earlier versions of MVS/SP and DOS/VSE has lagged behind IBM's expectations and research firms' projections (see story page 13).

An estimated 37% of the 19,775 IBM mainframes capable of running MVS/XA still run VSE, according to estimates from International Data Corp. in Framingham, Mass.

See **IBM** page 6

Factory systems stuck in low gear

By Rosemary Hamilton

ST. LOUIS — Computer-integrated manufacturing, heralded by consultants as the key to industrial competitiveness, continues to remain a distant goal for many manufacturers.

"CIM is what I consider a Star Wars approach," says James Chisholm, a logistics manager at Westinghouse Electric Corp.'s Automation Division in Pittsburgh. "The U.S. is saying to the Russians that there is a thing called Star Wars. Well, there is a thing called CIM, too, but it's a very broad concept, and there are lots of companies that still need to do the basics before they get to that point."

Chisholm is serving as this year's president of the American Production and Inventory Control Society, which hosted its annual conference here last week for about 4,000 attendees.

Interviews with attendees revealed that the basics of manufacturing automation,

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Some Memorex units expected to be retained as captive suppliers to Burroughs/Sperry. **Page 2.**

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Software AG targets end users with Super Natural upgrade. **Page 19.**

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Users struggle with links from Wang systems to IBM world. **Page 8.**

■

A Silicon Valley era ended late last week when Fairchild Semiconductor, one of the founding chip manufacturers, was spun off by parent Schlumberger Ltd. into a joint venture with Fujitsu Ltd.'s U.S. chip unit. San

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Ashton-Tate file manager aims low blow

By Peggy Watt

TORRANCE, Calif. — Ashton-Tate today is scheduled to introduce a $395 file manager for the IBM Personal Computer and compatibles that is aimed at warding off low-end competitors to its Dbase flagship product.

The product, Rapid File, which company officials said will be available before the end of the year, will compete with low-end data base products such as Software Publishing Corp.'s PFS:File and Alpha Software Corp.'s Alpha/Three as well as Symantec Corp.'s Q&A.

It reportedly reads Dbase files but lacks the older product's sophisticated programming functions. The program, however, has built-in form-letter and mail-merge capabilities and several standard report formats.

"I wish Ashton-Tate had incorporated some of the things they did with Rapid File into Dbase," said Mike McManis, a programmer for

See **ASHTON-TATE** page 4

CW SPECIAL REPORT

Users high on treasures of Sierra

By James Connolly

The computer that has taken so much of the rap for IBM's financial malaise — the 3090 mainframe — is rated highly by customers who used the machines during the first year of shipments.

Industry analysts have speculated repeatedly that 3090 orders have peaked. Various observers say those orders have slowed for several reasons, such as a lack of functional differentiation between the older IBM 3080s and 3090s, a sluggishness in selected parts of the economy and a user preference for smaller, distributed systems.

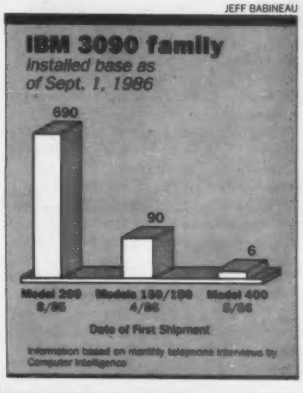
However, interviews with current and potential 3090 customers reveal that even with some companies reporting that they are forgoing 3090 acquisitions and other companies asking for enhancements, those that have had 3090s installed for a period of months say they are satisfied.

"Maybe we are a naive group, because we run a fairly simple, straightforward operation. But at the present time, it is giving us everything we looked for and hoped for," says data processing manager Bob Bone of the 3090 Model 200 installed in December at Bergen Brunswig Corp., the Orange, Calif.-based pharmaceutical firm.

In Bone's company, the 3090 replaced an IBM 3081 Model D, providing more power than the users currently need. "We almost

See **USERS** page 12

JEFF BABINEAU



Jettison of Memorex units would ease costs of merger

By Alan Alper

Burroughs Corp. is planning to retain the pieces of its Memorex Corp. peripherals subsidiary that will support its — and recently acquired Sperry Corp.'s — product lines, sources said last week.

Following the disclosure by a Memorex official that the peripherals company is for sale [CW, Oct. 20], it is believed by sources close to the company that Burroughs will jettison those Memorex business units that no longer fit the Burroughs/Sperry corporate mission.

Burroughs is said to be attempting to restructure its Santa Clara, Calif., subsidiary into a captive peripherals operation, with responsibility for purchasing, developing and manufacturing disk storage, tape and printer subsystems.

Under the piecemeal divestiture approach, Burroughs is believed to be contemplating selling Memorex's Communications Group, which markets IBM 3270-compatible peripherals, and the IBM plug-compatible manufacturer (PCM) disk and tape storage distribution portion of its Storage Equipment Group.

As part of this strategy, the company recently began integrating the data storage and printer operations of Burroughs, Memorex and Sperry into a single group under the direction of William Morgan, Memorex senior vice-president of product operations. Morgan, named a corporate vice-president of the merged Burroughs and Sperry, reports to a troika consisting of Phillip Dauber, Memorex's president; Hollis Caswell, president of Burroughs' Systems Products Group; and Hatim Tyabji, president of Sperry's Information Systems Products and Technology Group.

> ***'The fact of the matter is, there may not be a company called Memorex any longer, but there will be an operation to do all Sperry and Burroughs peripherals.'***
> — Memorex Corp. source

The Detroit firm is said to be considering selling the pieces of Memorex to retire some of the $2.9 million in debt it has taken on to acquire Sperry. Last month, Burroughs acknowledged that it was placing Sperry's Aerospace & Marine Group on the block [CW, Sept. 1].

Asked to respond to those reports, a Memorex spokesman deferred to a Burroughs spokesman, who declined comment.

"There is some activity to sell the company," said one Memorex insider who requested anonymity. "The fact of the matter is, there may not be a company called Memorex any longer, but there will be an operation to do all Sperry and Burroughs peripherals."

The source indicated that Burroughs is close to selling its struggling IBM PCM distribution business. "The impression I get is that it could happen in a couple of weeks," the source said.

A number of candidates have been mentioned, including Fujitsu America Ltd. and Hitachi America Ltd. In addition, Siemens AG and BASF Co., which are discussing merging disk storage operations, are believed to be interested in Memorex's large-scale IBM-compatible disk drive business.

Moreover, disk drive sources last week indicated that members of Memorex management have expressed interest in purchasing the PCM distribution arm from Burroughs via a leveraged buy-out.

"What we are hearing is the contingency planning that probably is going on in Detroit between [W. Michael] Blumenthal and a few corporate officers, which is being leaked by Memorex divisional managers," noted James Porter, a disk drive industry analyst and publisher of the "Disk/Trend Report." "Following the purchase of Sperry, they are probably considering a lot of things which may or may not come to light."

Porter said he was surprised that Memorex would be getting out of the PCM disk drive business after finally overcoming manufacturing problems on its IBM 3380-compatible drive. "It's hard to understand why they would do it. They had a tough 1985 when they lost the formula on the 3380, but they seemed to have recovered and regained the lost confidence of their 3380 customers," Porter noted.

Memorex temporarily withdrew its 3380-compatible drive from the market in September 1984 because of head crashes caused by problems with the disks that were manufactured by Disk Media, Inc., a Memorex/Control Data Corp. joint venture. CDC exited the IBM plug-compatible direct-access storage device (DASD) business later that year.

Memorex has also fallen behind IBM on the DASD technology. Two weeks ago, Memorex unveiled a double-capacity version of its 3380-compatible drive — the 3682 — approximately one year after IBM began shipping its product. Volume shipments of the double-capacity 3682 are not expected until the first quarter of next year.

One question raised by observers last week was, If Memorex becomes a captive peripherals supplier, what becomes of Sperry's disk drive purchase agreements with Hitachi and Magnetic Peripherals, Inc., a CDC-managed joint venture company in which Sperry is a partner?

"One thing is for sure, Memorex has excess capacity at its disk drive manufacturing facility in Santa Clara. Burroughs probably wouldn't mind filling it with commitments from Sperry," Porter noted.

Memorex's 3270-compatible peripherals business is said to be of interest to Telex Computer Products, Inc. A Telex spokesman said the firm had no comment at this time.

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AST sets integration role with publishing

By Peggy Watt and David Bright

NEW YORK — Continuing its diversification beyond board-level products, AST Research, Inc. is expected to introduce today a complete desktop publishing system.

The system will include an AST microcomputer based on the Intel Corp. 80286 microprocessor and a 40M-byte hard disk drive. The machine will be paired with AST's Turbo Laser Printer and Turboscan optical scanner, according to industry sources.

AST would not comment on hardware configurations, but Aldus Corp., Ventura Software, Inc. and Studio Software Corp. will lend their wares and participate in the announcement, said Charles Cortright Jr., director of marketing for AST's desktop publishing group.

"We're going to let the user choose," Cortright said of the available software.

Participants' wares

Aldus produces the page design program Pagemaker.

Ventura Software developed Ventura Publisher, which is being marketed by Xerox Corp. but is also available for other licenses by Ventura. Studio Software produces both Do-It and Frontpage for IBM Personal Computer-compatible systems.

"There are even more packages we'll be compatible with, but those are the top three," Cortright said.

He also confirmed that Postscript, a page description language used by many page design programs, will be implemented on AST's Turbo Laser Printer by March.

Desktop publishing industry watcher Tony Bove, coeditor of the "Desktop Publishing" newsletter, said the AST total system would cost between $10,000 and $12,000. "It beats the pants off the Xerox system and is more capable of being sold into business than the Macintosh," he said.

Packaged systems like AST's will help to lessen the confusion of buyers who previously had to put IBM PC-compatible desktop publishing systems together on a "mix and match" basis, said Arlene Karsh, director of computer publishing market research at CAP International in Marshfield, Mass.

Karsh expects the AST desktop publishing system will cost $10,000 or slightly less.

Ashton-Tate file manager out

From page 1

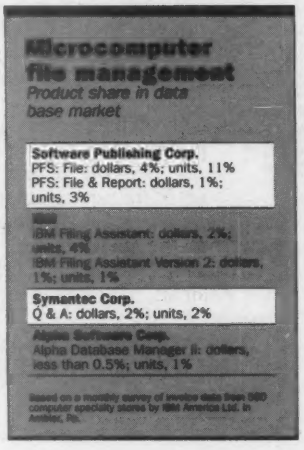
Professional Control Corp., an engineering firm in Germantown, Wis., that beta-tested Rapid File.

Rapid File reports can be printed using several standard, built-in formats, including mailing labels of several sizes. The user can also design a form, with the screen appearance accurately reflecting the printed output, Rapid File product manager Mike Arrigo said. To load a 1,000-record Dbase file takes 55 seconds. A 64,000-record Dbase file would take approximately one hour to load, Arrigo said.

Users can view a record in the built-in columnar table or in list forms or simultaneously through a split screen. The default is 254 characters in a field, which can be changed to as many as 64K bytes of characters per field. There is a maximum of 250 fields in a single record and 64,000 records in a file.

Although Dbase files go through an automatic conversion as they are retrieved, they can be read virtually immediately, said Eric Kim, Ashton-Tate's director of product marketing for data base products. However, reading Rapid File files from Dbase requires a one-step conversion that is a menu option, he said.

Rapid File also directly reads and exports files built under PFS:File and Professional File, Lotus Development Corp.'s 1-2-3 and any ASCII files.



Kim said the indirect Rapid File-to-Dbase connection was recommended by Ashton-Tate's corporate advisory board, which emphasized that though the products are somewhat compatible, they are intended for different uses.

But Donna Staats, a microcomputer manager at First Bank Systems in St. Paul, Minn., which uses many Ashton-Tate products, was doubtful about the validity of a partly compatible product. "Whenever we recommend a product, the most important consideration is compatibility upward and downward," Staats said. "Even if the user is a beginner, we assume they will have to communicate with the rest of our world. It's a disappointment that a product written by Ashton-Tate isn't directly file interchangeable."

While Ashton-Tate expects the new product may be adopted by some users who do not need the power of Dbase, the company will also market it as a companion product for users of Lotus's 1-2-3 who currently rely on the spreadsheet as a file manager, Kim said.

"That Lotus interface is a good idea," said Mary Ellen Powers, product manager for distributor Corporate Software, Inc. in Canton, Mass., and another beta tester. "When you tell users who use Lotus as a data base that they really should use a data base product, it's all the better when you can give them one that looks like Lotus."

Another beta tester said the familiar interface would enable Rapid File to coexist with Dbase. "We have quite a few Lotus users, and I think the interface would be quite advantageous to program for it," said Joe Marangell, a systems financial analyst for Warner-Lambert Co. in Milford, Conn.

The user of Software Publishing's PFS: products is a primary target, and Ashton-Tate market researchers decided even the added features of the PFS:Professional line, introduced in July, leave users wanting more power.

But Software Publishing appeared unruffled by the Ashton-Tate announcement. "It doesn't worry me too much," said David Burns, product manager of Software Publishing's PFS:Professional File. "I feel comfortable that our capabilities are on target."

Rapid File is not multiuser in its debut release but will run on a server for most IBM system networks, including PC Net, Novell, Inc.'s Netware and 3Com Corp's 3Plus network.

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Unix role expands as market grows, matures

By Eddy Goldberg

NEW YORK — Major manufacturers are now fighting for control and leadership in the Unix market, signifying the commercial arrival of the oft-maligned operating system, Robert R. Ackerman, president and CEO of Unisoft Corp., declared at last week's Unix Expo here.

Adding more luster to Unix was W. Frank King, general manager of IBM's Advanced Engineering Industry Systems Products in Austin, Texas."Unix is an important productivity tool," King said during his keynote address at Unix Expo.

King cited four reasons for business to be interested in Unix: the ready availability of Unix and a pool of talent to work with it; its portability; its openness to hardware and software extensions; and its "literacy base," or the large number of C language and Unix programmers coming out of universities.

International Data Corp. (IDC) predicts a $10 billion Unix system market in 1990.

As the Unix market matures, the focus of issues has shifted dramatically, Ackerman said. "Even six months ago it was all technical debates," Ackerman added. "Now people are talking about mainframe Unix, Unix tool development and Unix-to-IBM connectivity."

Denis Forster, a senior technical consultant in the data base area at Mobil Corp. in New York, has been working in the IBM world since 1969, and with IBM's IMS since 1971. He attended Unix Expo, at the suggestion of his manager, to get a first look at Unix.

"I've heard Unix is considered an elegant approach to an operating system. You can build up a very complex operating system and environment and develop very good applications from straightforward, simple commands," he said.

However, despite its potential, he was less sure of how well Unix is suited for developing large systems. "It seems to be behind [traditional operating system environments] somehow. What do you do now to take this Unix system and use it to develop a large data base system or large application?" he asked.

"The real issue," asked Lawrence J. Timmons, research analyst at the Gartner Group, Inc. in Stamford, Conn., "is what will Unix integrate with?"

The view from IBM is that Unix will coexist with other IBM operating systems, complementing them, King said.

"System extensions that bridge Unix to other IBM systems are fundamental" to Unix's success, he said.

Burroughs upgrades XE 500, plans post-merger line

By Eddy Goldberg

NEW YORK — Burroughs Corp. announced performance and expansion enhancements to its XE 500 family of multiple processor systems at last week's Unix Expo.

The XE 550, which a source inside Burroughs said "appears to be the mainstream Unix box for the Burroughs-Sperry combination," will gain in performance through use of a 16.7-MHz Motorola, Inc. 68020 processor, replacing a 10-MHz 68010.

The source also divulged that an overall Unix product line strategy has been worked out for the combined Burroughs-Sperry Corp. company, with a continued reliance on OEM agreements with Arete Systems Corp., NCR Corp. and Computer Consoles, Inc.

"The entry-level machine will be the Sperry PC/IT, closely followed by the NCR Tower series. The XE 550 picks up there and carries the product line right past the Series 5000 Model 90, leaving the Series 7000 at the top end," the source said.

Jerry Petersen, vice-president and program general manager of the Entry Level and Departmental Systems group, said this was an accurate description of the current view of the combined product line, with one exception. On a price/performance level, the XE 550 fits somewhere between the 5000 Model 50 from NCR and the 5000 Model 70 from Arete.

The XE 500 series consists of the XE 520, a shared-resource processor that functions as a large server for Burroughs' BTOS systems, and the Unix-based XE 550, which is the XE 520 with an additional board that enables it to become a Unix system.

Typical system costs will be in the $19,000 to $100,000 range, according to Petersen.

IBM casts lure to MVS users

From page 1

That means a potential 7,300 sites could become customers of the DOS/VSE conversion package.

Pegged for now at the same price as the existing version, Version 2 Release 2 will be available in the third quarter of 1987, according to an IBM announcement to customers last Tuesday. That price includes an initial license charge of $12,840 and a monthly fee of $4,280 for MVS/XA with Job Entry Subsystem 2 and an initial license charge of $14,430 and a monthly fee of $4,810 for MVS/XA JES3.

That price is 20% to 25% higher than that of MVS/SP, according to IBM officials.

In addition to the conversion package, IBM offered a number of improvements to MVS/XA.

"Most of these enhancements sound like IBM has fine-tuned MVS/XA," noted Brian F. Walsh, research analyst with The Yankee Group in Boston.

A feature has been added to MVS called Data in Virtual, which allows a data set to be mapped to a virtual address range where it can be referenced and updated by an application. The mapping takes place through assembler language routines; "Thus, the user can replace complex read/write and buffer management code with much simpler direct storage addressing logic," the IBM announcement said.

"It sounds like less page swapping is going on, less I/O. That's a performance enhancement," Walsh noted.

In a move that would reduce demand on main memory, IBM said MVS/XA now binds customization data with the initial loading of a program rather than during the booting of the operating system. "This allows one nucleus to be used throughout a multisystem installation, with each system being tailored using the new customization process," the IBM announcement said.

"This optimizes resource loading," Walsh noted.

The control blocks of the scheduler work area, the memory devoted to prioritizing and queueing tasks to be handled by the operating system, can now be moved above the 16M-byte virtual memory line to the 2G-byte area made available by 31-bit addressing. IBM has previously moved ACF/VTAM and TSO/Extended subsystems above the 16M-byte line, freeing up virtual memory for use in the 24-bit region. The scheduler work area continues that process but represents a smaller gain in virtual memory.

IBM officials said moving scheduler work area control blocks "will reduce one cause of system failure — out-of-storage ABENDS."

Harold R. Hickman, manager of computer services for the Northrup Aircraft Division in Los Angeles, said the Data in Virtual feature provides a way to "internalize the data set, to read it into main memory," but that the feature is limited in usefulness because it puts additional pressure on his system's main memory.

"I like the concept, but we're already seeing performance limitations in our TSO environment in real memory. It's competing with everything else that is already there," he said.

Version 2 has increased the limit on the number of data definition statements that can be used with each job step from 1,635 to 3,273, IBM officials said.

IBM also enhanced the Interactive Problem Control System (IPCS), the facility for diagnosing and reporting software problems, in MVS/XA. A standard IPCS dialogue is provided for systems programmers in problem analysis. The browse dump option is integrated into the IPCS dialogue, the IBM announcement said.

"The IPCS enhancements should reduce the amount of time expended by systems programmers. They allow more on-line analysis and reduce the need to do it by hard copy," Walsh said.

"Overall, it looks like an easier system to manage. MIS managers need to reduce their need for systems programmers, and anything that does is a benefit to them as well as IBM," Input's Digrius concluded.

Microsoft to unveil Word with DCA for Mac

By Douglas Barney

NEW YORK — Microsoft Corp. today is scheduled to announce Microsoft Word 3.0, a word processing package for Apple Computer, Inc.'s Macintosh that includes Document Content Architecture (DCA), IBM's proposed standard for formatting word processing documents.

Sources said the package will also run on Centram Systems West, Inc.'s Tops, a product that allows Macintoshes to share files with IBM Personal Computers and compatibles.

Microsoft refused to comment publicly on today's announcement.

With DCA, the Microsoft word processor can send and receive files from an IBM host environment as long as the user has a physical link to the mainframe, a Microsoft source confirmed. Many word processors for the IBM PC, such as Multimate from Ashton-Tate, include DCA.

But according to Jeffrey Tarter, publisher of "Soft-Letter," DCA capability is not a major factor in a word processor's success. "I have not heard of many people using DCA very much, and it has been around for years," Tarter declared.

Support for Tops is more important, according to Tarter. "To me, the main reason for using Tops is to hook into a PC network, and it is remarkable that it does it," Tarter noted.

The way to effectively use Tops is to have an IBM PC and a Macintosh application share the same data format, said Nat Goldhaber, president of Centram. "A Mac can literally open up a document sitting on an IBM PC and use it as if it were a Mac file, and vice versa," Goldhaber said. Tops runs on the Apple Computer, Inc. Appletalk local-area network.

Microsoft obtained the effect of sharing data formats between Word for the IBM PC and Word for the Mac, even though the products use different formats. "Word 3 will read PC Word files automatically," a Microsoft representative said.

A user contacted by *Computerworld* expressed interest in the product but knew few details. "The network would help, but we are not using Tops right now," said Rick Richardson, national director of micro technology for Arthur Young & Co. in New York. Richardson said Arthur Young already has a product that provides DCA capability.

In addition to providing networking and DCA file conversion capabilities, the product runs faster than its predecessor, a Microsoft source confirmed. According to sources, however, the Microsoft package does not support the use of Digital Equipment Corp.'s VAX minicomputers as file servers, a trend that is emerging among Macintosh software developers and is endorsed by Apple.

"We are seeing a strategy by Apple to focus on the DEC architecture where there is a common fit," said Steven R. Nelson, marketing manager for Kinetics, Inc., a Walnut, Calif.-based supplier of Apple networking products. According to Nelson, developing ties to IBM's often disparate architectures is a more difficult task than networking to VAX systems.

DEC tightens grip on VMS licenses, outlaws transfers

By Charles Babcock

MAYNARD, Mass. — Digital Equipment Corp. is tightening its control of the transfer of its VMS operating system and other software to third parties.

The company's new policy will take effect Jan. 1 and will forbid the transfer of software by the original licensee to a third party. Instead, the third party, such as the buyer of a used VAX, will be required to obtain a new VMS license rather than use the existing copy of the operating system, said Peter Mercury, DEC's software products group manager.

"When you sell your car after installing a Midas muffler, the warranty on the muffler doesn't transfer with the car. It's going to be the same thing with our software," Mercury said.

"As of Jan. 1, 1987, we will no longer accept requests for license transfers. This particular action is aimed at discouraging unauthorized movement and usage of software," Mercury said in a prepared statement.

The status of such transfers has bedeviled DEC in the past as company lawyers spent days unraveling who held the license and how much support was guaranteed after the user acquired software and equipment from another DEC customer, according to a DEC spokesman, who spoke on Mercury's behalf.

The purchaser of used equipment will pay the same price for VMS and other DEC software as a new customer because he will get the latest version of the software and accompanying support, the spokesman said. VMS is priced at $10,000 to $40,000, depending on the processor model, he said.

"This is not just some Machiavellian scheme to pull in money," the spokesman added, but he could not predict for certain that it would not yield greater revenue for DEC.

By selling a third-party buyer new software, DEC's support staff can be certain that the customer is using the release he thinks he is, the DEC spokesman noted. Industry observers have pointed out that the practice will also tend to restrict the support offered to third-party buyers who receive illegal copies of VMS and other software from unscrupulous resellers.

DEC spokesmen could provide no estimate of how frequently such copying occurred or how much the new policy will restrict it.

"We spin a lot of wheels here trying to figure out who holds the license," the spokesman said, acknowledging that the policy was likely to save DEC operating expenses in that area.

Mercury said the new policy will not affect DEC OEMs' rights to sublicense software.

TOP OF THE NEWS

NEWS from page 1

Diego-based Fujitsu Microelectronics, Inc. will control 80% of the merged company. Founded in 1957, Fairchild was the spawning ground for the leaders of several top U.S. chip makers, including Robert Noyce, Gordon Moore and Andrew Grove of Intel, Jerry Sanders of Advanced Micro Devices and Charles Sporck of National Semiconductor.

■

This Friday, Microrim, Inc. is scheduled to announce R:Base Graphics, a $295 graphics package designed to work with the full line of R:Base products. The firm is also expected to announce that Clout, a natural-language interface for R:Base, R:Base Extended Report Writer and R:Base Program Interface — a library of routines for applications developers — will all work with R:Base System V, the latest data base release.

■

Marking its rocky transition from the OEM business to vertical markets, Convergent Technologies reported a $25.7 million loss and named a new president. Cyril Yansouni, 44, was named president to replace Paul C. Ely Jr., who remains chairman and chief executive officer. Yansouni, head of Hewlett-Packard's personal computer division, will focus on Convergent's computer technology, while Ely will concentrate on new acquisitions for Convergent's Small Business Services arm.

■

Retix is scheduled to announce on Wednesday software that implements on a variety of systems the Message Handling System portion of the X.400 electronic mail standard. The product, written in C, is the first to conform fully to the latest National Bureau of Standards Open System Interconnect Workshop Implementors' Agreements, Retix claimed.

■

Locus Computing Corp. demonstrated an alpha release of its Merge 386 product running Unix and Microsoft MS-DOS co-resident on an Intel 80386 processor at last week's Unix Expo show in New York. Merge 386 is expected to be in beta test by year's end, according to Gerald Popek, president of Locus.



Wang users seek improved links to IBM mainframes

Firm vows to work on VS communications

By Donna Raimondi

BOSTON — Technology to bridge Wang Laboratories, Inc.'s systems to the IBM environment is readily available, but implementation is difficult, Wang users said last week.

For many of the 2,000 attendees at the International Society of Wang Users annual meeting, communications and networking were crucial issues. While Wang willingly demonstrated strategies to meet those needs in the years ahead, users illustrated that real-life situations are often not as easy as vendors claim.

Union Mutual Life Insurance Co. in Portland, Maine, an IBM 3090 and Amdahl Corp. 5870 shop, bought two Wang VS 65s for its legal division's work late in 1985, said David Robertson, the project's implementer.

"We can pass data through to the mainframe, and we are trying to link Wang Office and IBM's Professsional Office System (Profs), but it is rocky." Union Mutual tried using a popular switching software package that did not do the job and is now evaluating Wang/Profs Gateway, Wang's software bridge to Profs.

At the Pentagon, where the armed services have IBM and Amdahl mainframes and "dozens" of Wang VSs, Profs and Wang Office are already linked, Army Comptroller Ronald Jaruth said.

"The problem with implementing that link is on the IBM end," he said. Jaruth's staff mapped out lines so the IBM host would know what it was talking to on the other end. "If you make one mistake, it doesn't work," he said.

Wang will now concentrate on large-scale systems integration and integrated products, while shooting for communications abilities that will allow its equipment to be tied together with Wang and other customer environments, said keynote speaker Fred Wang, Wang's executive vice-president and treasurer.

Wang aspires to 18% annual growth to attain $5 billion in revenue by 1990, and it predicts that the computer industry in general will average 12% growth, Wang said.

"Office automation is becoming a destructive term," said John Wheeler, director of MIS at W. R. Grace & Co.'s Industrial Chemical Group. Every terminal at Grace should be capable of communicating with every other terminal there, regardless of function, he said.

Today's user requirements for data processing and networking in multivendor shops, compared with yesterday's user of word processing, office automation and electronic mail, have put enormous demands on Wang's ability to supply satisfactory support, according to Wang Vice-President of Operations Support Donald Desrochers.

While hardware maintenance is the most mature support group, the 4-month-old software services program still has some problems, he said. "We made a $70 million investment in software support, but the pace at which we implemented new programs and changes caused difficulties for the users and for us." The difficulties have to do with tracking, measuring and forecasting demand for service.

Users at the show did not agree with Desrochers that the service function is "vastly" improved. "We are just now reaching a happy compromise with Wang on service," said Union Mutual's Robertson. He experienced "culture shock" after dealing with Wang's service organization, he said. "Wang wasn't used to dealing with a company our size."

One frustrated participant proclaimed: "I don't want to know that Wang has problems with software service — I already know that. I want to know what Wang will do about it."

Factory systems stuck in low gear

From page 1

such as manufacturing resource planning (MRP II) software and just-in-time manufacturing, continue to be of primary concern.

Users say their major goals are selecting a manufacturing automation plan and selling it to both management and workers, a difficult task since both MRP II and just-in-time techniques depart from traditional manufacturing methods.

"We're at the base line," said Roland Labonte, vice-president of engineering and manufacturing services at Amity Leather Products Co. in West Bend, Wis. Labonte said he attended the conference to gain more information on just-in-time manufacturing.

"We're just cutting our teeth. We've talked about CIM, and now we're implementing a just-in-time work cell," he added. "It's too soon to evaluate it. It's really different, so there are plenty of mixed emotions."

"CIM is there in some companies like Caterpillar Tractor and certainly GM and Ford," said Richard Clough, manager of wage, measurement and training at General Electric Co.'s facility in Somersworth, N.H. "But even there, it hasn't been a long time. There are other companies like us that are making evolutionary changes, not revolutionary ones."

At Gates Rubber Co. in Elizabethtown, Ky., there are 13 plants, all of which are in different stages of automation, noted Steven Reed, MRP II coordinator of Gates Rubber's automotive/hardware division.

Reed said an MRP II package from Cullinet Software, Inc. was installed at his facility this year. "Right now, my job is 90% training and education," he explained. "The idea is for more planning and less reacting. That's a whole new way of running the business. One of my primary jobs is to promote change."

Similarly, at the glass fabricating plant of PPG Industries in Pittsburgh, a CIM education program has just been launched.

"Our plant is 20 years old, so that's 20 years of ingrained thinking," said Paul Gunia, supervisor of information systems. "We started a task force last month, and now our programmers are trying to develop a new mindset. They're used to traditional users, and manufacturing doesn't make it easy for them."

Gunia, who predicts that it will be 10 to 15 years before his company has a true CIM environment, said "the technology exists for CIM, but right now, we're educating the masses. We're going to have to work together, which means management styles will have to change."

One user said he has been successful with his educational program, primarily because he works at a small company, where groups of five employees or fewer can be assembled to learn about CIM.

The atmosphere is less intimidating and more efficient than large groups, according to Tom Leonard, materials manager at Proconics International, Inc., a robotics manufacturer in Woburn, Mass.

In addition to educating workers, a steering committee of only four people was formed to make decisions, such as the recent implementation of an MRP II system and a few just-in-time practices.

"We've got to be on top of things, or we'll be devoured," Leonard said. "When I was at Analogic Corp., I was on an MRP committee of 12 people. We'd be planning something, and then the next week, four people wouldn't show up."

On the other hand, when implementing just-in-time principles, size often counts, Leonard added. A key principle to just-in-time manufacturing is to keep inventories down, meaning users must remain firm with vendors regarding shipment schedules. Naturally, the larger the user, the more the vendor listens.

"We've had a few vendors who were supposed to ship, say, on the 15th of the month, and they shipped the first week of the month," Leonard said.

"I sent it back, and believe me, they didn't take too kindly to it. But I think they're getting the message," Leonard added. "We're still a long, long way from CIM."

Likewise, at the Naval Avionics Center in Indianapolis, a CIM environment is at least four years away, staff member Ray Utterback said.

"I don't think true CIM will ever be fully realized, but in four years, we'll have accomplished major automation goals," he said of the facility, which makes military electronics components. "We formally began an automation plan four months ago. The immediate challenge is to determine what we should do and to develop a methodology."

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Cincinatti ..... Aug 5, Oct 21
Cleveland ..... Jul 22, Sep 23, Oct 28, Nov 13
Columbus ..... Aug 12, Sep 24, Oct 29, Nov 12
Dayton ..... Sep 9, Nov 5
OK Oklahoma City .. Sep 3, Dec 3
Tulsa ..... Aug 26, Nov 19
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PA Allentown ..... Sep 11
Harrisburg ..... Nov 6
King of Prussia ..... Jul 24
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Software provides OSI link between IBM PC, VAX

By Elisabeth Horwitt

SCOTTS VALLEY, Calif. — A software product expected to be introduced today offers hope of multivendor and multinetwork connectivity on a level that has been promised, but is so far largely undelivered, by the still-evolving Open Systems Interconnect (OSI) standard from the International Standards Organization.

Touch OSI, from Touch Communications, Inc., is an extended implementation of the OSI subsets Manufacturing Automation Protocol (MAP) and Technical Office Protocol (TOP), with added software that enables users to access directories and data on other networked systems "transparently, as if they were part of his own system," according to Touch General Manager Dennis Morrison.

The product provides communications among users and applications on either IBM Personal Computers or Digital Equipment Corp. VAX/VMS systems, over either Ethernet or the IBM Token-Ring network. Touch OSI's Internetwork Routing software converts an IBM PC into a gateway between the two types of networks.

"This level of integration is extremely important, because there are real gaps in the current MAP/TOP software, which makes system integration a massive task," said Anthony Friscia, president of Chicago consulting firm Advanced Manufacturing Research.

At a beta-test site at Boeing Computer Services Co.'s OSI Laboratory in Seattle, Touch OSI enabled approximately 12 IBM PCs to communicate over linked Ethernet and token-ring local-area networks. A later phase of the test will include two other sites and at least one VAX/VMS implementation of the product, said TOP/MAP program manager Laurie Bride.

"Touch OSI totally conforms to OSI protocols, but also has bells and whistles that provide greater functionality than a strict MAP/TOP implementation," Bride claimed.

For example, an IBM PC user can invoke common Microsoft Corp. MS-DOS commands to copy or delete a file or call up a directory on another PC or a VAX or Microvax II on the network.

A user request for a file located on a remote computer is handed on to File Transfer Access and Management protocol, a MAP/TOP program that sends the request across the network to its counterpart on the receiving system (see chart above).

Touch OSI performs a similar function for single-user MS-DOS software packages that request data or directories on remote systems.

"It fools the software into thinking the file is on a local disk, when it is really on a remote networked system," Bride said.

Standard MAP/TOP protocols, which are not integrated with a computer operating system, require a much more complicated set of commands to be keyed in manually in order to call a remote file, Bride said. Boeing plans to implement Touch OSI on its OSI networks if the beta test is successful, she added.

Although Touch claims that all PC packages tested so far work with its product, Bride suggested that some application packages that were not written for the PC Network interface Netbios will not work in the Touch environment.

As soon as the current MAP 2.1 and TOP 1.0 converge as MAP/TOP Version 3.0 early next year, Touch will implement the new protocols in its product, Morrison said.

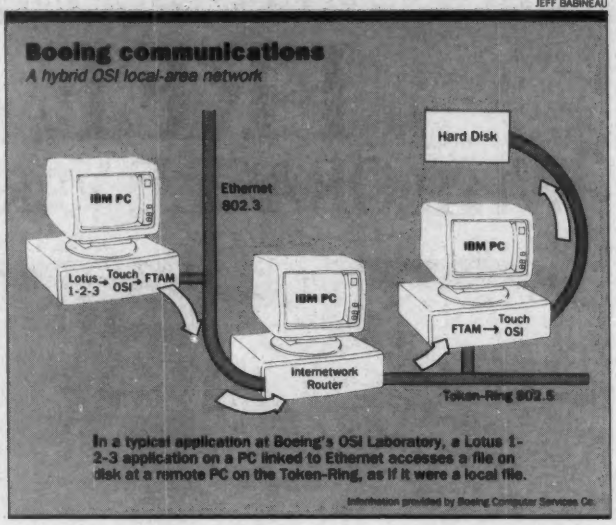
Other higher level OSI protocols, such as the X.400 electronic mail standard, will be added to the product in future releases. The company is currently working on a link between OSI and IBM's Systems Network Architecture.

Touch OSI will be released in the fourth quarter of this year. The package for VAXs and Microvax IIs running VMS is priced from $4,000. Packages for IBM PCs and PC ATs using IBM PC-DOS will be $300 per copy.

The software supports CCITT 802.5 standard token-ring network adapters from IBM and Texas Instruments, Inc. and CCITT 802.3 Ethernet controllers from Ungermann-Bass, Inc. and DEC. CCITT 802.3 is the OSI network level specified by TOP.

Touch OSI does not currently support a CCITT 802.4 token-bus network as specified by MAP. "We purposely decided to emphasize the TOP office environment, where there is a big emphasis on preserving applications and user interfaces," Touch President Charles Bass said. He added that migrating the software to an 802.4 board is a "modest task."

JEFF BABINEAU



In a typical application at Boeing's OSI Laboratory, a Lotus 1-2-3 application on a PC linked to Ethernet accesses a file on disk at a remote PC on the Token-Ring, as if it were a local file.

Information provided by Boeing Computer Services Co.

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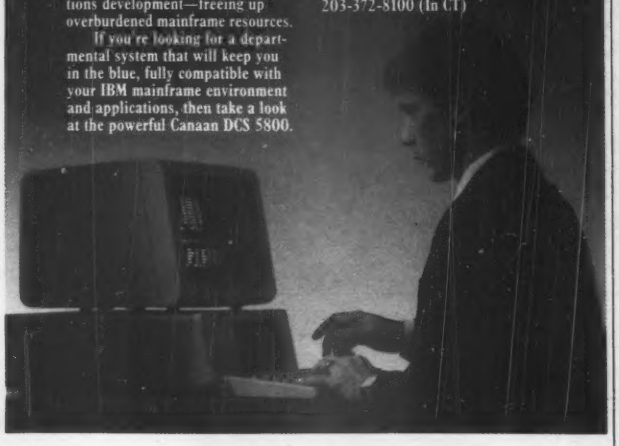
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Users high on Sierra's treasures

From page 1

tripled our capacity. We needed half to two-thirds more and got almost three times the power that we had before. We went from a situation where we were at our limit to where we have an excess now," Bone comments.

More than 750 of IBM's most powerful processors have been shipped to U.S. customers since the first 3090 Model 200 dual processor was installed at a Texaco, Inc. facility near Houston in September 1985. Market research firm Computer Intelligence says that as of Sept. 1 of this year, the installed base of 3090s stood at 90 for the Models 150 and 180, 690 for the Model 200 and six for the Model 400, which was first installed just two months ago.

Another market research firm's figures for the 3090 installed base a month later showed 825 systems installed in the U.S. International Data Corp. (IDC) officials say that 725 of those were Model 200 and Model 400 shipments. In comparison, IDC and Computer Intelligence have estimated the installed base of the 5-year-old 3080 mainframe family at approximately 3,800.

When asked what sets his company's 3090 Model 180 apart from its predecessors, IBM's 3033 and 3083, Guy Battista, vice-president of technical support at Shawmut Corp. in Boston, says, "I think it's the reliability. And, the thing comes in, they drop it in and within a week they have it up and running." Battista, whose bank received the first of the uniprocessor Model 180s in March, adds, "It was one of the easiest installations I've been through." He says that the 3090's automatic remote call-in facility for diagnostics is a useful feature.

Positive attitudes

The upbeat comments of Bone and Battista are typical of 3090 users surveyed recently. Even those managers who want to see power and communications enhancements for the 3090s were generally positive in their critiques of the systems, which range in size from the uniprocessor 3090 Model 150 to the four-processor 3090 Model 400.

Battista also reports that Shawmut's system had something wrong with the microcode when it was delivered. Without detailing the incident, he adds, "It was more of a nuisance than a problem, and the factory came up with a fix for it."

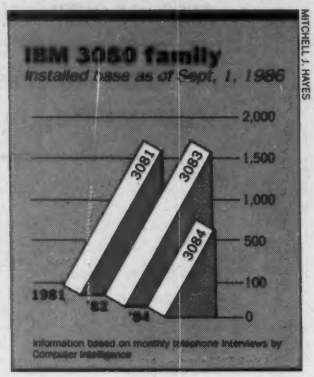
The most significant negative report on a 3090 came out of the Midwest several months ago. In that case, sources outside of the user company said a bank had power problems with a Model 200 and that IBM technicians disassembled the system on the computer room floor before finally replacing the machine with a new Model 200. Officials at that user company declined to confirm or deny those reports and commented that they are happy with IBM.

Suggestions for wish list

Other users report few and minor reliability problems, but most also have at least one suggestion when asked about a wish list for 3090 enhancements.

"One thing we wish IBM had already announced is where the switch is so we can turn that switch and get the 3090s up to full speed," Texaco's Ed McDonald says with a laugh. McDonald, who is Texaco's division manager for information processing, oversaw the total replacement of IBM 3080 series systems with 3090s in Texaco computing facilities in Bellaire, Texas, and Tulsa, Okla.

"We are exceptionally pleased with the reliability. There have been some outages, but that is to be expected with any system, particularly one that you get so early," McDonald says. He reports a 98% uptime during prime shift for one 3090.



McDonald notes that he would like to get more power from the approximately six 3090s Texaco now runs, but not because the 3090s are underpowered.

Power is habit-forming, with people wanting a second performance boost as soon as management gives them one, McDonald says.

"The major problem we have is that the 3090 needs to be faster. We could use another 25% without even blinking. With earlier systems, the constraints we faced had been related to memory or I/O capacity. But now we are using all of the cycles available to us, and that is the immediate bottleneck we are facing," McDonald says.

He reports that the 3090s provide Texaco with the same number of million instructions per second while taking up less floor space than the earlier 3080s.

Unlike some smaller facilities where managers said they have not tried the feature, Texaco makes heavy and successful use of the expanded storage capability in the 3090s, according to McDonald.

McDonald is one of several managers who say they wish IBM would

See **USERS** page 13

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NEWS

MVS/XA gaining acceptance, dominance

Expanded storage feature key on 3090

By Charles Babcock

POUGHKEEPSIE, N.Y. — Although installations of IBM's premier MVS/XA operating system have lagged behind predictions, IBM officials say XA sites now constitute more than half of the MVS user base.

That level is far behind the 60% to 70% formerly projected by industry analysts for early 1986. Version 2.2 of MVS/XA, announced last week (see story, page 1), was accompanied by a migration system to move VSE users into MVS/XA.

Nevertheless, passing the 50% mark means IBM's strategic production system has crossed its watershed with users and appears to be gaining inexorable acceptance. Despite problems in converting assembler applications to MVS/XA and drawbacks in migrating to it under VM/XA, its six million lines of code will continue to have a broad effect on the software market into the 1990s.

"The focus of development is clearly on XA. . . . It will continue to be the flagship of the fleet for large-scale production systems," says Richard B. Butler, director of IBM's Myers Corners Laboratory. The sprawling lab, set in the countryside of the upper Hudson Valley near Poughkeepsie, is IBM's main development site for MVS/XA.

When it was first delivered to customers 3½ years ago, MVS/XA offered relief from their virtual memory constraints. MVS/XA seized an additional seven bits for virtual memory addressing, increasing word length from 24 to 31 bits and raising the virtual memory limit from 16M bytes to a massive 2G bytes.

MVS/XA pushed back other system limits in a similar fashion. MVS/370 had been limited to 16 channels per processor. MVS/XA offers a potential of 256 channels per processor (the maximum exploited today is 96), with dynamic routing of I/Os through the channels so that a channel and processor are no longer tied up waiting for interrupt messages to resume processing.

But some of the benefits of MVS/XA, such as expanded storage, remain vaguely understood or have only come to light with the implementation of MVS/XA on the 3090. "When IBM introduced the technology of expanded storage, it did not know how good it would be," says William R. Davis, manager of systems programming and network services for Applied Data Research, Inc., a Princeton, N.J., software developer.

Expanded storage — not to be confused with main memory, virtual memory or direct-access storage devices (DASD) — is semiconductor memory devoted to the operating system's paging supervisor. It has the performance characteristics of main memory, but it is not addressable by applications programmers; rather, the operating system takes advantage of it for transferring blocks of data to and from central storage, Butler explains.

At ADR, Davis found his IBM 3081 mainframe was going to the disk at a rate of 200 page/sec., a consumptive amount of I/O system resources. With the use of expanded storage on ADR's 3090 Model 200, "paging constraints have been drastically reduced. Most of the time the 3090-200 is not paging to any DASD," Davis notes.

> ***'When IBM introduced the technology of expanded storage, it did not know how good it would be.'***
>
> — William R. Davis
> Applied Data Research, Inc.

Another recent effect on MVS/XA has been IBM's continued movement of heavy transaction processing systems above the 16M-byte line. To maintain compatibility with earlier systems, XA had to maintain all its function within the 16M-byte, 24-bit world of MVS/370. At the same time, that world was constrained by its limited virtual memory and crowded common storage area. So IBM has been freeing up the region below the 16M-byte line by rewriting systems to run in the 31-bit area above the line, MVS/XA users say.

In some cases, large users of full-function IMS still find the common storage area a constraint on their system, IBM spokesmen say. The common storage area is the part of virtual memory used by VTAM, CICS, IMS and other volume systems to store data that is in use by more than one program. A terminal user communicating with the central processor might have his data stored temporarily in the common storage area by VTAM until it could be passed to CICS, IBM officials explain. The more terminals and systems using the common storage area, the greater the likelihood of constraint, although that likelihood has decreased as IBM moved ACF/VTAM above the line in mid-1985 and TSO/Extended at the start of 1985.

As these large transaction systems moved above the line, they began to exploit another feature of MVS/XA, extended common storage area, or common storage created in the huge, 2G-byte block of virtual memory above the line.

"You now have a lot more room for applications to run. You can design applications that you couldn't even think about before," says Russell Artzt, senior vice-president for development at Computer Associates International, Inc. in Garden City, N.Y.

"VTAM used a tremendous amount of common storage. With the new release of VTAM, it's kind of like being free again," ADR's Davis declares.

In the past, IBM customers have been forced to relieve their system constraints by buying another processor. With the efficiencies built into MVS/XA, "the one CPU environment becomes a much more lucrative thing," Davis says.

IBM's Butler says MVS/XA does not inflict performance penalties on the host CPU, despite its many added features. A subsystem like TSO/Extended actually runs 6% faster under MVS/XA than it does under the standard 370 MVS/SP system, IBM spokesmen say.

Butler says IBM will continue to service the MVS/370 system as long as there are enough customers to justify doing so, and the 370 version will continue to receive support for new processors, but IBM is putting its development money behind XA.

MVS/XA runs on a smaller range of processors than the VM operating system. It is restricted to the 370 class, from the 4381 to the 3090, excluding the 3031s and 3033s. MVS/XA with the Job Entry Subsystem2 (JES) is available for an initial license charge of $12,840 and a monthly fee of $4,280. It is available with JES3 for an initial license charge of $14,430 and a monthly fee of $4,810.

Butler says the prices represent a 20% increase over comparable charges for the MVS/SP.

Users high on Sierra's treasures

From page 12

increase the channel capacity on the 3090s. In Texaco's case, that would be useful in communicating with scientific systems. But other managers want a 4.5M-byte or 6M-byte channel speed to improve direct-access storage device (DASD) communications or just to save space.

"What we were hoping to see on the 3090 was a fiber capability so we could have faster channels and smaller cables. From what I read and hear from the research people, the potential is there," comments Ron Cook, vice-president with E. F. Hutton & Co. in New York. Cook adds that faster channels and smaller cables for E. F. Hutton's Model 200 would save the company space. He says the shortage of computer room space in the New York area limits E. F. Hutton's ability to expand its 3090 complex.

Cook says that his users have noticed a difference in performance in the 3090 and that the transition was smooth. "There definitely is a difference in performance. The 200 is a dual-processor CPU like the 3081K, just twice as fast. But the architecture is the same. I really don't look at it as anything more than a bigger 3084Q or 3081K."

Another New York-area data center manager, Senior Vice-President Jack Owen of Shearson Lehman/American Express, Inc., notes that faster channels would allow his company to run fewer channels with fewer controllers.

But both Cook and Battista say they feel sure that IBM has such a capability awaiting announcement.

"I figure that more than likely they have something under the covers for greater transfer to DASD," offers Battista.



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Groups to lobby for blue-ribbon computer policy panel

By Mitch Betts

WASHINGTON, D.C.— Computer industry associations, joined by the Data Processing Management Association (DPMA), are gearing up to lobby early next year for legislation creating a blue-ribbon Information Age Commission to study the public policy issues of computer technology, association sources said.

At a private meeting on Oct. 17, members of the coalition created two task forces: one to set a strategy for congressional passage of the bill and the other to establish a private-sector group to provide organizational and financial support for the commission, according to Glenn Davidson, chief of staff of the Computer & Communications Industry Association (CCIA).

The legislation would create a two-year commission with 23 members to study such issues as privacy, employment, technological innovation, education, national defense, international competitiveness and "the effort and resources needed to maximize the benefit to society of computer and communications systems."

Joseph E. Collins, manager of governmental affairs for the DPMA in Park Ridge, Ill., said the commission is needed to study such issues in a comprehensive, rather than piecemeal, fashion. The DPMA recently adopted a resolution supporting a national dialogue on U.S. high-tech policy, he noted.

"It's an opportunity for national introspection," said John R. Clement, director of governmental activities for the American Federation of Information Processing Societies in Reston, Va.

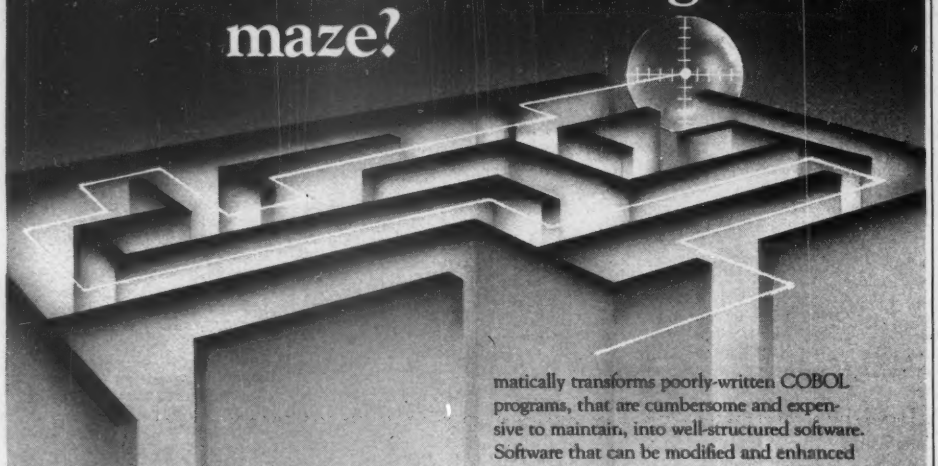
One group that will not be joining the bandwagon is the Computer and Business Equipment Manufacturers Association (CBEMA), because some CBEMA members are concerned that the commission could lead to more government regulation of the industry, sources said. CBEMA spokeswoman Charlotte LeGates said, "We have decided not to sign on to that legislation because we have not discerned the need for it."

Legislation to create an Information Age Commission was approved by the U.S. Senate earlier this month, but the House of Representatives did not have time to pass it before the 99th Congress adjourned. The legislative action will start again in the 1987 100th Congress.

The Senate stripped the bill of language appropriating $3 million in government funding for the commission, so the industry coalition has begun to seek private-sector funding.

"Although this will be a privately funded organization, congressional passage of the legislation will add legitimacy, viability and credibility to the organization," noted Davidson of the CCIA.

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Lotus aims word processing kit at technical users

By David Bright

CAMBRIDGE, Mass. — Lotus Development Corp. last week announced a technical word processing package, called Manuscript, and a data acquisition package, called Measure. Both are designed for scientists and engineers who use personal computers.

According to product marketing director Rick Treitman, technical users account for at least 17% of Lotus's installed 1-2-3 and Symphony user bases. Most scientists and engineers spend much of their time acquiring data, analyzing that data and documenting their findings, Treitman said.

The Manuscript word processing package can import graphs and spreadsheet data and data base files from 1-2-3 and Symphony, and the Measure data acquisition program loads data collected from measurement tools directly into 1-2-3 spreadsheets. Each program costs $495.

Treitman claimed Manuscript will have a broader appeal than Lotus originally expected. Manuscript is built to accommodate documents up to 800 pages and can mix text and graphics such as tables, diagrams and equations on the same page. It also features automatic footnoting, cross-referencing, indexing, a table of contents, a built-in outliner and the ability to produce equations and special symbols.

A page preview function, which requires a graphics card, lets the user inspect each page of the document before printing. The package supports scanners and a wide range of printers — from dot matrix to laser. Despite its advanced word processing features, Manuscript is not sophisticated enough for desktop publishing, Treitman said.

Both packages will be available within two months. Lotus will sell Manuscript through its normal distribution channels, but will target Measure at value-added resellers and interface and tool manufacturers.

The two products are the first to come out of Lotus's 2½-year-old Engineering & Scientific Products Division.

Microsoft, HP, Aldus team up in desktop publishing thrust

Windows gets push as printing environment

By Peggy Watt

SANTA CLARA, Calif. — Microsoft Corp.'s crusade for its Windows operating environment received a boost last week when Hewlett-Packard Co. and Aldus Corp. announced they will team up to promote what they call the complete publishing system.

"Windows can be at the center of the desktop publishing world and allow all the pieces to work together," Microsoft President Bill Gates said at his company's third Windows Development Seminar.

The three companies will conduct a joint marketing campaign focusing on the use of HP's hardware, Aldus's page design software and Microsoft's operating environment for publishing applications, he said.

Laserjet graphics

Hardware manufacturer HP also announced implementation of the promised graphics capabilities on its Laserjet printer line with the Laserjet Publisher Kit, a plug-in board for IBM Personal Computer-compatible systems running Imagen Corp.'s Document Description Language.

The Laserjet Publisher Kit will be available early next year and will retail for less than $2,500, according to John Doyle, executive vice-president and general manager of HP's systems technology sector. The upgrade brings the price close to the $4,999 price tag of Apple Computer, Inc.'s Laser Writer, which runs Adobe Systems, Inc.'s Postscript page description language.

The two Laserjet products will be promoted with HP's PC AT-class Vectra microcomputer, Microsoft Windows and Page Maker page design program from Aldus as a total desktop publishing solution for the corporate user, according to representatives from the three companies.

Windows strategy

Aldus President Paul Brainerd called Windows a strategic part of desktop publishing on Microsoft's MS-DOS systems, since it allows the same kind of graphical and easy-to-use interface that enabled Apple's Macintosh to burst into the market.

Desktop publishing industry analyst Tony Bove, coeditor of "Desktop Publishing: The Bov & Rhodes' Inside Report," praised the cooperative effort. "The road show is a very good idea to start a focus on the AT-class machines," he said, adding he was disappointed that a scanner manufacturer was not included in the alliance.

Ajit Kapoor, director of Electronic Publishing Market Analysis at Dataquest, Inc., declared that each of the three companies "brings their own strength" to the union and predicted a ready audience.

'A real solution'

"A large installed base of PC users has been wanting to do desktop publishing," Kapoor said. "This makes it a real solution, rather than something done rather disjointedly through smaller companies."

The alliance may also hasten corporate attention to publishing on personal computers said Joe Vetter, a Microsoft national accounts executive.

"Right now, we're trying to get as many applications under Windows as possible," which is only a plus for corporate customers considering the package, Vetter said.

But the publishing aptitude of Windows was reflected in last week's announcements of products that will soon run under Microsoft's graphical interface. They include the following:

- Scanner manufacturers Datacopy Corp., Hammerlab Corp. and Microtek Lab, Inc., all of which announced versions of their scanner software that will transfer images into the Windows interface.
- A new technical drawing package, Easidraw, which will run strictly under the Windows interface, from Mitac, Inc.
- Windows versions of software already available on the Macintosh, including Cricket Graph business presentation program from Cricket Software, Inc.; Pro3D drawing program from Enabling Technologies, Inc.; and Click Art graphics design from T/Maker Co.
- Added font and graphics libraries for import into Windows, including Diagraph art from Computer Support Corp.; World Inprint art from Dynamic Graphics, Inc.; a new electronic publishing system, Inprint, from A.B. Dick Co.; Postscript fonts from Adobe; and new fonts designed for Windows by Bitstream, Inc.

Chances are you don't currently audit your operating system—even though it's ultimately in control of information used to manage your organization. And for good reason.

For the most part, you don't audit the system because the software is just too complex. Then too, certain hard data on system controls is usually unavailable. And a manual review would take weeks to perform, require outside experts, and cost too much.

Those are some of the main problems AEX2-Examine/MVS software is designed to solve. This new software package now makes it possible for you to get the information you need to effectively analyze your MVS environment. So when top management asks how you know your data center business controls are working, you'll have the answer.

Through its more than 100 on-line displays, AEX2-Examine/MVS software lets you perform a completely *independent* audit, right from your own terminal. You interact with the software in a conversational mode, guided by a series of menus.

AEX2-Examine/MVS software gives you a more complete, up-to-date picture of your total operating environment—in real-time. Instead of waiting hours to get a report on system status, you can immediately check the status of system controls, key system libraries, files and tables.

AEX2-Examine/MVS software also helps your DP staff become more productive by improving their knowledge of the system, its controls, and its level of operating efficiency. In effect, it puts MVS under a cost-conscious microscope.

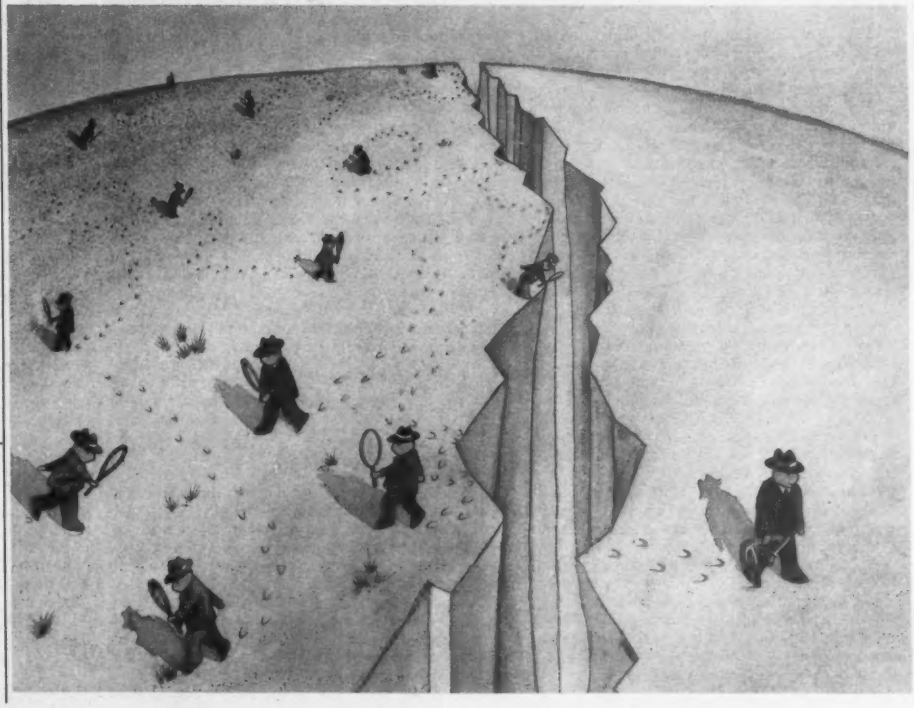
Tighter business controls, more accurate information and improved data center productivity are all key management objectives for the coming decade. AEX2-Examine/MVS software provides a tool to help you achieve these strategic objectives *today*. And positions you to meet your increasingly stringent demand for due care in the future.

For more information, contact Shawn McLaren today, at 1333 Lawrence Expressway, Santa Clara, CA 95051-3595; (415) 941-4558; Telex 357437. AEX2-Examine/MVS is developed and maintained by SKK, Inc., Rosemont, Illinois. [redacted] Examine/MVS and AEX2-Examine/MVS are trademarks of SKK, Inc.

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VIEWPOINT

EDITORIAL

A call for consensus

What the world does not need, most of us would be quick to agree, is one more blue ribbon commission that meets for endless hours of hearings only to issue a ponderous report that gathers dust on library shelves.

Why then have so many of the major computer industry trade and professional associations — the Data Processing Managers Association chief among them — banded together to aggressively lobby Congress to form just such a commission, this one on the public policy issues associated with computer technology? Not only that, they promise to find the $3 million to fund it.

What these groups cogently argue is that all three branches of government daily make decisions that seriously affect not only the way we conduct our professional lives as members of the computing community, but also the way we and our neighbors conduct our private lives.

We can hardly overestimate the current, and currently increasing, role of government in information technology. As the world's largest user of computer equipment — at an estimated $16 billion in 1987 — the federal government shapes the direction and application of computer technology.

In its legislative halls, Congress is increasingly preoccupied with information technology: Twenty-four of its 42 committees discuss technology in one way or another, and in their last session, legislators introduced more than 500 bills containing provisions on information technology.

That says nothing about the substantial roles of executive branch agencies such as the National Bureau of Standards and the National Science Foundation nor about the powerful influence of the judiciary — most clearly illustrated by Judge Harold Greene's dismantling of AT&T.

Yet there are no agreed-upon guidelines to apply to this wide-ranging policy making, no agency or method in place to even monitor and document the decisions.

The current effort aims to create a congressionally chartered commission that can become a forum where all of us can begin to articulate and debate the litany of issues related to information technology. What safeguards will be needed when expert systems begin influencing government decision making? What of unemployment caused by automation? Does technology that allows easy, inexpensive copying make current copyright law obsolete?

The need for such a forum is recognized by groups across the entire political spectrum. While computer industry groups lobby for a privately backed Information Age commission, others, such as the American Civil Liberties Union, call for a joint commission of Congress.

The goal is the same: to create public awareness and, eventually, consensus concerning the use of information technology, a consensus that will bring order to the sometimes conflicting and contradictory policies now being initiated by various agencies of government.

For their leadership in this important effort, the DPMA and other industry groups deserve both credit and, more important, support — first, in creating the commission, then in participating in its efforts, so that its work does not fall victim to the dusty-shelf syndrome of many of its predecessors.



LETTERS TO THE EDITOR

Evaluating SQL's place in the sun

I read the article on Structured Query Language [CW, Sept. 22], and agreed wholeheartedly with Stephen Gerrard. The idea of using SQL for applications development was studied by the Dannon Management Information Systems Group for nearly six months. Our goal was to find an SQL-based system that could be used in a transaction application and ported from personal computers to Unix-based hardware, depending upon the transaction levels at various locations.

We were never able to warm up to SQL as the only language for the development effort. Classic features such as IF, THEN and ELSE, temporary data fields and so on weren't present. Additionally, the lack of a menu system to tie it all together and the need to use C or Cobol with embedded SQL to accomplish complex tasks was not our idea of high-level, fourth-generation language development. Productivity gains on the SQL side would be outweighed by the need to learn and use another language, compiler and menu system, all of which may or may not be portable to other hardware.

We ultimately selected Data Language Corp.'s Progress data base management system. Granted, no SQL, but a very high-level language, data protection, superior performance and portability from PCs to Digital Equipment Corp. VAX 780s without changing code. SQL was found not be be as important as we originally thought.

Mr. Gerrard's article confirmed my gut feeling that SQL has a place in the sun but not in the applications development arena.

David J. Berry
Director of MIS
The Dannon Co.
White Plains, N.Y.

EDI: How sweet it is

I read with special interest the Executive Report, "Electronic Data Interchange" (EDI) [CW, Sept. 22]. Much to my amazement, there was no mention of the grocery industry, its retailers, brokers and manufacturers and their successful use of EDI for the last three years.

Companies such as Super Valu Stores, Inc., General Mills, Inc., Procter & Gamble Co., Safeway Stores, Inc., General Foods Corp., Dow Chemical Co., Kraft, Inc., Bordens, Inc., Campbell Soup Co., Frito-Lay, Inc., and E. J. Brach & Sons, to name just a few, are using EDI in a paperless production mode.

To illustrate the growth of EDI, in 1982, 7% of all E. J. Brach & Sons' purchase orders and outgoing invoices were transmitted through EDI. This percentage grew to 25% in 1985. Our forecast for 1986 is 30%, and our goal is to have 50% of our purchase orders and invoices processed automatically with EDI by 1988.

Robert D. Hampson
Manager, Systems and Programming
E. J. Brach & Sons

Devaluing 'artificial intelligence'

Over the past decade or so I have seen many words become devalued to the point of meaninglessness. Terms such as "user-friendly," "integrated," "relational," "fourth-generation" and "committed to excellence" come readily to mind. Now it seems it's artificial intelligence's turn.

And what about a recent system that I was solemnly assured was the "first process-control system with artificial intelligence?" I happen to know that this so-called artificial intelligence was, in fact, a straightforward implementation of a finite-state machine. But I could hardly argue with the salesman that this *wasn't* artificial intelligence, since neither of us had a definition of what artificial intelligence was.

I have little objection, however, to the term "expert system." I regard such systems as rather clever implementations of the navigation of the network of rules experienced practitioners use in their fields of endeavor. Especially exciting is the fact that most such systems separate the navigational engine and the network compilation from the specific content of the rules themselves. Thus, these shell-based systems achieve wide applicability across disciplines.

But are expert systems — although clearly much more sophisticated — any more artificially intelligent than my date-validation routine? It seems to me that with the current definition of artificial intelligence we must regard either all computer software as being artificially intelligent or none of it.

Only when I see a computer performing an action that it was not specifically programmed to do will I finally believe that true artificial intelligence has arrived.

Mellr Page-Jones
President
Wayland Systems Development, Inc.

VIEWPOINT

The mystery of the expiring Information Center

At first we were pretty sure a murder was being planned. We knew who the target was: a 12-year-old of Canadian descent. Very young to be snuffed out. Especially this 12-year-old who had had so many early successes and such vigorous growth.

We rounded up the suspects. We were pretty sure the hit was being engineered by that one group of tough-looking customers brought in for questioning: the directors of MIS and the data processing managers.

You've heard the kinds of things some of them have been saying. In speeches and in print, right out in the open, bold as brass. They say once the Information Center has trained the users to take care of themselves; it's time for the Information Center to disappear. MIS will handle the job.

Modern-day Johnny Appleseeds

Of course, most MIS people agree that Information Centers were needed at first. Especially in the days when, like modern-day Johnny Appleseeds, companies scattered personal computers among their employees with wild abandon and a little fertilizer. ("Here's the user manual; it's real easy to understand. See you later.") The applications backlog was supposed to disappear, and productivity was to magically blossom.

No wonder the users looked for help; no wonder the Information Center was such an early success. The authors of last year's Second Crwth Information Center Survey noted that only 14% of the Information Centers they surveyed existed in 1980. In 1981 the number of Information Centers doubled and growth from that point on was rapid and steady. Crwth Computer Coursewares, a Santa Monica, Calif., research firm, cites an American Management Association report that claims 80% of the billion-dollar companies had Information Centers in 1985 with one-third of them begun the previous year.



By JOHN L. KIRKLEY

If the centers are so helpful and healthy, why would MIS want to bump them off? In the September 1986 issue of *Information Center* magazine, Naomi Karten explains: "Information Center services are beginning to duplicate the efforts of MIS or user departments. Competition is in the air."

Now we have a motive. The Information Centers are taking on a life of their own and challenging MIS. And we have an opportunity. More and more MIS directors are being asked to sit in on company deliberations about information strategies and company-wide information architectures.

Now we have a bleak picture. The young Information Center is pitted against the older, entrenched MIS/DP veterans, the survivors of corporate wars. But, before we reconcile ourselves to having a corpse on our hands, we must look at all the evidence.

For example, all Information Centers are not alike. Their survival rate has a lot to do with their parents and the environment in which they were brought up. The clue as to whether the Information Center will make it is in these sentences from Shaku Atre's new book, *The Information Center: Strategies and Case Studies*:

"Sometime between its second and fifth birthday, the Information Center usually goes through a metamorphosis. It grows from a start-up operation to a mature Information Center," Atre says. "Whether or not it reaches that stage as a department contributing to the productive health of the corporation ... depends a great deal on who provided the charter for the Information Center to begin with. The most successful Information Centers are started both by users and someone from MIS."

Such seems to be the key for the survival and growth of the Information Center: MIS involvement right from the beginning. Atre recommends that, at start-up, the Information Center should be established as a separate department on the same level as other applications programming departments reporting to MIS. "A separate department projects an image of commitment to both end users and data processing," she says. "At maturity, the Information Center should be moved to the same level as the applications development function. It should retain its separate identity."

Long walk, short dock

The message is simple: If the Information Center does not want to be taken for a long walk on a short dock, it has to mind its parents (MIS/DP); not go through a surly adolescent rebellion ("Who needs you? I can take care of the users all by myself."); and seek an interactive relationship with top management and MIS.

Information Centers must also be committed to data base development. The Information Center that can only offer PC training and spreadsheet classes will wither and die. They cannot ignore the push to connectivity and the end-user movement into networking, imaging, voice and data applications.

Also, an agreement must be reached as to what MIS will handle and what belongs to the Information Center. And finally, the Information Center must follow the same path that has been recommended for MIS: a new emphasis on business skills, strategic planning and on becoming more knowledgeable about corporate goals — the larger picture.

Kirkley, a former editor of Datamation *magazine, is an industry consultant currently acting as editorial advisor to Patricia Seybold's Office Systems Group.*

Sizing up computers: From supermicros to super supers

Remember the line about "jumbo shrimp" being either monstrous shrimp or little jumbos? The computer industry is experiencing a phenomenon that's about eight times more complicated and not nearly as amusing.

We now have more classes of computers than products available. New products come with ready-made classifications that separate them from the crowd, simply because they are part of that new category.

Each passing week makes it harder to separate one type of computer from another, and the introduction of Intel Corp.'s 80386 chip further confuses things.

Super supercomputers

Starting at the top, there are Cray Research, Inc. computers. These are supercomputers — super computers if you talk to most of Cray's customers. Control Data Corp. makes supercomputers, as do many of the Japanese computer manufacturers. ETA Systems, Inc., a firm created by CDC, is attempting to take the high end of this market by introducing a new *super* supercomputer.

How about companies that make little supercomputers, or "minisupercomputers?" They sell computer power on economies of scale; for instance, machines with one-quarter the power of a Cray at one-tenth the price. The primary players at this level are Floating Point Systems, Inc., Scientific Computer Corp., Alliant Computer Systems Corp., Flexible Computer Corp. and Convex Computer Corp.



By HARVEY P. NEWQUIST

These companies have each taken a different approach to creating minisupers. Floating Point makes add-on devices for existing Digital Equipment Corp. and IBM machines, Scientific offers Cray-compatible machines (with Cray's blessing), Flexible uses an expanding processor concept and Alliant and Convex are attempting to hit the VAX market with supercomputers in the same price range.

Next, we have the venerable mainframe. Near the top of this line is the IBM 3090/Sierra. Companies such as Honeywell, Inc., NCR Corp. and Sperry Corp./Burroughs Corp. have machines in this arena, most priced upward of many millions of dollars. In fact, they cost much more than minisupercomputers, but their use is more business-oriented.

Mainframes do serve the vital purpose of allowing the world to separate minisupers from superminis. Whereas minisupers are a kind of shrunken supercomputer, superminis are grown-up minicomputers. Companies such as Data General Corp. and DEC, the mini pioneers, now give us machines in both categories, and like just about everything else in world, the only difference between superminis and nonsuperminis is power and cost.

That's about as straightforward as the delineations get, believe me. IBM is now part of this act with its brand-new 9370 supermini, which incorporates the System/370 mainframe architecture. Talk about clouding the issue.

Lastly, we get to micros. But thank God for engineering workstations that allow us to separate minis from micros in much the same way as mainframes separate minisupers and superminis. Engineering workstations come in all shapes and sizes. They are usually single-user machines utilized for graphics, engineering and science applications. Traditionally, they have also been one step above the lowly micro — supermicros, if you will.

But that looks as if it may change shortly. The introduction of the 386 chip will give personal computers — sorry, micros — the ability to operate with the speed and efficiency equivalent to some existing engineering workstations. As a matter of fact, with the addition of networking capabilities, the line between micros and minis will start to blur.

Fully loaded micros already have minicomputing power, and the new generation of chips will start to erase the remaining differences. In essence, micros, minis and workstations will become one and the same.

Personal supercomputers

Had enough of supers, minisupers, mainframes, superminis, supermicros and micros for one day? Not yet, you haven't. A company named Cullen Scientific Systems Corp. introduced a personal supercomputer this summer in an effort to bring more supercomputing power to the individual level.

And IBM has its new "desktop" version of the 43XX minicomputer series slated for delivery in the near future. I think that "desktop" has something to do with being "personal," but don't quote me on that.

You can probably throw out all the designations and use any name that you want. Personally, I am still waiting for the real big little one — the Supercomputer Jr.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

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SOFTWARE & SERVICES

SOFTLINE
Joseph W. Schmitt

SQL pays off in real dollars

Charles Babcock, in his Softalk columns of Sept. 15 and 22, told us about the flaws of IBM's SQL. Stephen Gerrard of Applied Data Research, Inc. amplified the details of those flaws in an In Depth article in the Sept. 22 issue of *Computerworld*.

Obviously, Babcock and Gerrard have not used SQL themselves.

Babcock admitted at the beginning of his column that he spoke with several IBM competitors to find the flaws, and I appreciate that candor. I'll be as candid. I recently left my position as administrative vice-president of a large beverage distributor in Chicago and have formed a new company to sell consulting services and software based on an SQL system.

Babcock stated that "SQL doesn't exist as an independent language. Rather it must be embedded in programs written in assembler, Cobol or other third-generation languages where it opens the door to the data in a relational data base." This is incorrect.

We have been using SQL for 24 months and never had to think at all about another language except in two instances when we wanted to copy data from VSAM files into our data base. We spent about three man-days writing those programs in PL/I. For the remainder of the 24 months, SQL has stood alone very well, thank you.

The payoff from using SQL is in real dollars. Beverage sales managers often

See **SQL** page 21

Schmitt is chairman of Reltron Business Systems, Inc., a start-up company in Glen Ellyn, Ill., engaged in SQL consulting work.

4GL allows prototyping

Software AG eases Super Natural's restrictions

By Charles Babcock

RESTON, Va. — A fourth-generation language that allows end users to go beyond querying and reporting to prototyping and data base management has been announced by Software AG of North America, Inc.

Software AG, the vendor of the fourth-generation language Natural, brought out Super Natural, a menu-driven subset of the language for end users, a year ago. The 7-year-old Natural language is in use at 2,000 sites worldwide, while Super Natural thus far is in use at 360 sites, according to Software AG officials.

"There were a lot of restrictions in the first version of Super Natural that were difficult to get around. The second version has really opened up the gates and given us more flexibility," said Larry Lammers, project administrator for Natural systems at Inland Container Corp., a corrugated container producer in Indianapolis. Inland Container is serving as a beta site for Version 2.

The previous version of Super Natural was a basic query and reporting tool capable of accessing VSAM files on files in Software AG's Adabas. Version 2, available Dec. 1, includes a report editor — which is lacking in Version 1 — that allows a user to customize reports and modify report formats or total portions of a column of figures within reports, Lammers said.

Version 2 allows end users to create their own files on a mainframe Adabas data base management system, which they can add to or delete from. Through another product, Natural Connection, those files can be transferred to an IBM Personal Computer or compatible for use in an application like Lotus Development Corp.'s 1-2-3. The end user may then upload 1-2-3 files through Natural Connection to the data base, Lammers said.

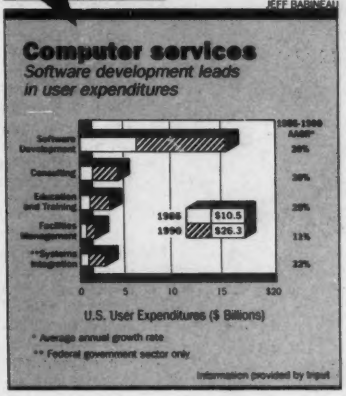
Super Natural users were previously limited to downloading files to the 1-2-3 application, he added.

Super Natural users may also add to, change or delete production files in an Adabas data base management system — if you want them to have that power, said Jeffrey L. Bailey, data base manager at Inland Container. "We're not using that

See **4GL** page 20

DATA VIEW

JEFF BABINEAU



Unify unveils SQL interface for DBMS

NEW YORK — A speedier SQL interface has been introduced for queries to the Unify data base management system and for use in the Unify Corp.'s Accell integrated development system, Unify officials said last week at the Unix Expo in New York.

Unify is a relational data base management system that runs under Unix on mainframes, minicomputers and microcomputers and under IBM PC-DOS on the IBM Personal Computer. Dubbed Turbo/SQL, the interface will run on Digital Equipment Corp. and AT&T 3B minicomputers as well as IBM mainframes and a variety of supermicro hardware, according to Unify officials. Turbo/SQL is

See **UNIFY** page 20

INSIDE

Comshare announces a micro version of its business modeling decision support system/**20**

The Systems Center adds high-volume data transfer packages/**20**

NEW THIS WEEK

- ISSCO announces two visual project management software packages
- For more on this and other new products, see pp. 83-89.

INSTANT ANALYSIS

"IBM is slowly coming to the realization that the strategic contribution of software far exceeds its actual effect on profits. Ultimately, software development drives hardware purchases."

— Scott M. Smith, vice-president, Donaldson, Lufkin & Jenrette

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☐ **REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.**
Relational DBMSs have always dealt with logical sets of data. But they manipulated only one physical record at a time. V5 eliminates overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

☐ **REASON #3: PARALLEL-PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.**
V5 is 100% re-entrant shared code, and ORACLE's parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multi-processing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor configurations.

☐ **REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.**
ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

☐ **REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION**
Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

☐ **REASON #6: EFFICIENT ROW-LEVEL LOCKING OPTIMIZES TRANSACTION THRUPUT.**
Row-level locking and a read-consistency model optimizes ORACLE V5 transaction concurrency. For the first time, high transaction thruput is achieved by a fully relational DBMS.

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Spend half a day at an Oracle seminar in your city, and find out how you can have the benefits of a portable, DB2-compatible relational DBMS... and save half a computer. Call our national seminar coordinator at 1-800-345-DBMS. Or write **Oracle** Corporation, Dept. V5, 20 Davis Drive, Belmont, CA 94002.

Modeler comes to PC

ANN ARBOR, Mich. — Comshare, Inc. recently announced the release of Personal W, a personal computer version of its business modeling decision support system, System W.

The package is designed to run on an IBM Personal Computer XT or Personal Computer AT and requires a minimum of 348K bytes of memory, Comshare officials said.

Personal W uses a screen orientation, modeling syntax and modular approach similar to the mainframe System W package. English-language relationships can be used to define consolidations in budgeting and financial reporting applications, Comshare spokesmen said.

Business models can be developed on personal computers and transferred to the mainframe under the system. Personal W may also be used for a distributed modeling application, such as those used in corporate budgeting, spokesmen said.

Personal W replaces an earlier product, Micro W, that was introduced in 1983. Personal W is priced at $595, according to Comshare.

4GL allows prototyping

From page 19

capacity right now," he noted, since the integrity of the corporate data base is paramount at the firm. Bailey said the features of Natural Security, a product that enforces security measures for Natural, also works with Super Natural.

Lammers said the prototyping capability added to Version 2 was an attractive feature, "but I'm not sure where it fits in." Inland had Version 2 in use for only a week at the time Lammers and Bailey spoke.

Screens can be generated in Super Natural for setting parameters and selecting standard modules of code for constructing simple applications. The applications themselves are composed in Natural and, once constructed, can be called to the screen for further customization by a Natural programmer, Software AG officials said.

"In the past, we were locked into menu-driven screens," Lammers noted.

Bailey said prototyping is a feature that only a handful of Super Natural users were likely to require. In effect, it appears to offer data processing programmers an avenue through which they may do a quick fix on a Natural program through an on-line terminal. Of about 20 Super Natural users in his company, about 10 are outside the DP department, he noted.

"It's a first step toward an application generator," Bailey said, adding that the step is useful at a shop where major systems will be redone in Natural during the next two years. At the end of the rewrite process, Super Natural will become a common tool for end users throughout the corporation, according to Bailey.

Super Natural will be available Dec. 1 at a price of $35,000 under the DOS operating system and $45,000 under MVS.



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High-volume data transfer packages bow

DALLAS — The Systems Center, Inc. has announced two high-volume data transfer products, Network Datamover-VSE and Network Datamover-MVS/Netex, for use under IBM's VSE and MVS operating systems.

Network Datamover-VSE is designed for high-volume data transfer requirements on IBM mainframes running VSE on an IBM Systems Network Architecture network. As a member of The Systems Center's Network Datamover line, it is compatible with MVS systems and IBM Personal Computers running Network Datamover, company spokesmen said.

Network Datamover-VSE provides direct data transfers between mainframes, eliminating the need for intermediate staging, according to Systems Center President John J. Barry.

Network Datamover-VSE can respond to on-line user requests and provides automated operation through interfaces to applications, according to Barry.

Network Datamover-VSE is available immediately for $19,500. A copy is needed for each CPU engaged in the transfer, so a minimum of two copies is required.

The second product, Network Datamover-MVS/Netex, is available at a price of $34,000 per copy. Discounts are available for copies purchased in addition to the first copy per site for both products.

Network Datamover MVS/Netex interfaces with T1 transmission capabilities of Network Systems Corp.'s Hyperchannel hardware. It gives users features to manage the high-speed data transfer, company spokesmen said.

In addition, spokesmen said the company was making available Extended Submit Facility, with which users may queue a data transfer to a nonactive network node to be processed automatically when the node is activated.

Unify unveils SQL interface

From page 19

based on IBM's SQL and will be available in November with upgrades or new purchases of Accell and Unify. Unify is available at prices ranging from $1,495 for an IBM PC to $80,000 for an IBM mainframe. Accell, which includes a fourth-generation language, application generator and windowing interface, is priced from $4,500 to $100,000, according to spokesmen for the company in Lake Oswego, Ore.

Turbo/SQL includes the Smartsearch component, which allows SQL to utilize statistical tables actively maintained within the data base to derive the shortest access time to process a query, Unify spokesman Bill Merchant said.

It also includes Dynamic Virtual Sort, a proprietary sorting algorithm that evaluates the memory requirements of a query and operating system to tailor memory allocations. By optimizing memory demands, the impact of queries on other users is minimized, Merchant said.

A third feature, Nested Query Optimization, speeds up complex queries. Turbo/SQL reportedly builds a table of the results of previous query selections to eliminate redundant disk retrieval.

SQL pays off in real dollars

From page 19

need vast amounts of selected-detail sales history to prepare unanticipated analyses to meet competitive situations. Before 1985, each special request from one of our managers typically took one to three weeks to fulfill.

We had to write a batch program for each particular report. Many of the requests, of course, were never fulfilled at all.

By mid-1985, we had learned to use SQL well enough so that I could sit with a sales manager at an interactive terminal and explore data and discuss results. Often, the manager's request would be continually reshaped as we explored.

No printed reports

In many instances, 20 to 40 minutes in front of the terminal gave the manager all the answers he needed. No printed reports, no programming.

More complicated requests might take one to four hours to answer with SQL. Nevertheless, the sales manager usually had the formatted printout from SQL, with calculated percentages and subtotals, on his desk the same day. Still no programming.

By the end of 1985, we had eliminated the backlog of requests for special sales reports because we had eliminated all programming of them. Our programming staff was able to concentrate on system controls, data validation, accounting controls, etc. Our whole electronic data processing operation reached a new level of sophistication.

IBM 4331s do billing

Our company, Romano Bros. Beverage Co., is a large independent wine and spirits distributor in Chicago. It annually ships 3.5 million cases of wine and spirits to 9,500 retailers in northern Illinois. Two IBM 4331s do the billing, inventory control, warehouse picking, truck routing and accounts receivable.

We installed SQL/DS running under DOS/VSE in October 1984. At the time, IBM recommended against this, saying that a larger mainframe running under VM was needed.

In spite of IBM's misgivings, SQL has proven invaluable to Romano Bros., even in this underpowered configuration.

Used SQL to comply

We used SQL at Romano Bros. to comply with an increase in the federal excise tax on beverage spirits, which went into effect Oct. 1, 1985. Since the tax increase was based on alcoholic content of spirits, but not of wine or beer, we had to determine which of our 1,780 products were spirits; the liquid content per bottle of each were in the warehouse at 12:01 a.m. on Oct. 1; and the taxable dollar value of all the preceding.

We gathered all the fundamental data through a series of Selects on the SQL data base, inserted the results into some special tables and then did new Selects on the intermediate data to perform all the calculations and print the final schedules then did new Selects on the intermediate data to perform all the calculations and print the final schedules and summaries.

These ran several hundred pages. In about three man-weeks, we were able to complete a job I estimate would have taken three man-months to program and test in PL/1 or Cobol.

Flow uninterrupted

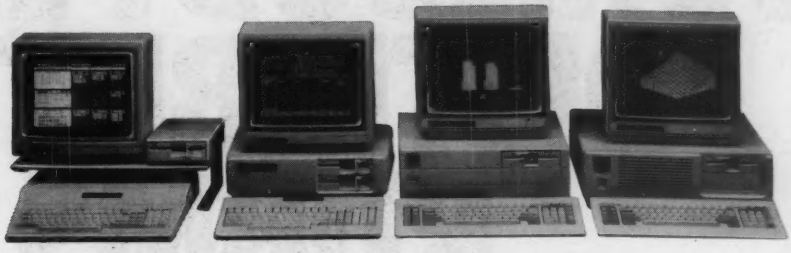
The whole job was done without stopping the daily flow of business for even an instant.

Romano Bros. was the first wholesale distributor in the country to pass audit by the Federal Bureau of Alcohol, Tobacco and Firearms.

We were complimented by the bureau for having well-organized records and summary reports. Only one adjustment was made on our tax return; the bureau refunded $235 out of several hundred thousand dollars because we had made a clerical copying error on one of the detail sheets.



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At a suggested list of less than $800, the Tandy 1000 EX is a true MS-DOS personal computer. It has 256K of memory, a built-in 360K disk drive, integral 90-key keyboard, MS-DOS 2.11 and our graphics-oriented Personal DeskMate™ software. The Intel 8088 cpu operates at 4.77 MHz or at 7.16 MHz—a 50% faster clock speed than the IBM PC.

The Tandy 1000 SX

A high-performance version of America's #1 PC compatible, the Tandy 1000 SX features 7.16 MHz and standard 4.77 MHz clock speeds. It comes with 384K of memory (expandable to 640K on the main board), two built-in 360K disk drives, MS-DOS 3.2, DeskMate II™ software and five PC compatible card slots—all standard.

The Tandy 3000 HL

An affordable alternative to the IBM PC/XT® Model 286, the 3000 HL comes with a 360K floppy disk. It is easy to expand with a 20 or 40 MB hard disk, or a 5¼" built-in 20 MB Disk Cartridge System. The advanced 16-bit microprocessor, operating at 8 MHz, delivers up to seven times the speed of a standard PC.

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MICROCOMPUTERS

MICRO BITS
William Zachmann

Javelin's price is all right

Picking the correct price for personal computer software is one of the toughest choices a vendor faces. As with books and records, the material costs of the package are usually quite small. And as Philippe Kahn's Borland International, Inc. has so convincingly demonstrated, software that sells in very high quantities can be very profitable, even at a low selling price.

Still, for many vendors, a low price and high volume strategy looks about as appealing as leaping off a high cliff without a parachute. It seems so much easier to get to a profitable position with high unit prices.

At the same time, products like Analytica Corp.'s Reflex can't help but be a reminder that what seems the safest course may not be safe at all. A nicely designed and well-reviewed product, Reflex was originally priced in a league with Lotus Development Corp.'s 1-2-3 and Symphony and Ashton-Tate's Dbase products.

Unfortunately, unit sales of the product were not sufficient to keep the company going. Reflex was then acquired by Borland and repriced at $99; it quickly became one of Borland's most successful and profitable products.

Javelin Software Corp. clearly doesn't want to go the way of Analytica. Fortunately, Javelin's management is showing a willingness to learn and adapt that should give the company's superb financial analysis package, Javelin, a chance for the success that this software deserves.

Javelin was unveiled last year with an awful copy protection scheme —

See JAVELIN'S page 28

Zachmann is vice-president of research at International Data Corp.

Tandem adds AT clones

Cuts compatibles' prices, abandons Dynamite line

By Jeffry Beeler

CUPERTINO, Calif. — Seeking to create a broad upgrade path for its intelligent workstation family, Tandem Computers, Inc. has added three models to the line of IBM Personal Computer AT-compatible machines.

In a related move, Tandem has also reportedly cut by 13% to 25% the prices for its 6AX workstation family's two existing members.

Announcement of the three 6AX series additions has prompted Tandem to retire its existing Dynamite line of intelligent workstations, which were not completely compatible with IBM, according to a Tandem spokeswoman.

Of the 6AX family's three newcomers, one incorporates 30M bytes of hard-disk storage while the other two models provide 1.2M- and 2.4M-byte floppy disk modules.

As its name suggests, the 30M-byte 6AX/30 attempts to bridge the gap between the Tandem workstation family's two existing members — the 6AX/20 and the 6AX/40, which support 20M and 40M bytes of hard-disk storage, respectively.

The 1.2M-byte 6AX/1 and the 2.4M-byte 6AX/2, meanwhile, serve as the product line's entry-level units.

Together, the three additional workstation models increase the 6AX's range of performance options and extend the product family's upgrade path, the spokeswoman said.

Although the workstations can run in a stand-alone mode, they are intended primarily to serve as intelligent terminals with Tandem's on-line transaction processors (OLTP).

To optimize the 6AXs as components in an OLTP network, Tandem has equipped them with function keys, special display capabilities and other features that a typical PC AT-class micro lacks.

Prices for the 6AX/1, 6AX/2 and 6AX/30 are $2,395, $2,595 and $3,395, respectively. Tandem has trimmed the price of the 6AX/20 from $3,995 to $2,995 and that of the 6AX/40 from $4,495 to $3,895.

INSIDE

Epson introduces a compact laser printer/**26**

Okidata announces its first laser printer and enters PC modem arena/**27**

NEW THIS WEEK

- Tatung enhances its Model TCS-7000 IBM PC AT compatible
- For more on this and other new products, see pp. 83-89.

INSTANT ANALYSIS

"Compaq did a very bold move. If I were IBM, I'd wait 'til Compaq had 100,000 machines or more, then I'd introduce a 386 machine that was not compatible."

— Philippe Kahn, Borland International president, on Compaq Computer Corp. beating IBM to market with an Intel Corp. 80386-based system.

IBM laptop gets Hayes modem

ATLANTA — Hayes Microcomputer Products, Inc. last week announced an asynchronous 1,200 bit/sec. internal board modem for the IBM Personal Computer Convertible laptop microcomputer.

The Smartmodem 1200C is said to be identical in function to the Smartmodem 1200B and includes a "sleep" mode feature that minimizes the amount of power the modem receives when not in use. Smartmodem 1200C is CCITT V.22-compatible, operates at 300 bit/sec. or 1,200 bit/sec. and includes call-progress monitoring and built-in test and diagnostic modes.

The company also announced a 3½-in. microfloppy disk version of its Smartcom II microcomputer communications software for the PC Convertible. Both are scheduled to be available in the first quarter of 1987.

HP module brings Unix to portables, speeds file access

By Eddy Goldberg

NEW YORK — In an attempt to provide C programmers and Unix developers with a full implementation of Unix on a transportable computer, Hewlett-Packard Co. last week introduced an $1,195 read-only memory (ROM) module for its Unix-based Integral PC.

Targeted at Unix and C language programmers who need to work both at home and at the office, the HP 82987A Software Engineering ROM Module eliminates the need for a hard disk by storing HP-UX within the module. HP-UX is HP's implementation of AT&T's Unix System V Release 2 operating system.

The ROM module contains more than

See HP page 28

Broderbund claims document manager allows shared edits

Users say program cuts rekeys, takes disk space

By Peggy Watt

SAN RAFAEL, Calif. — Broderbund Software, Inc. last week announced For Comment, a document management program that allows numerous reviewers to coordinate their editing of a single project.

The program, which runs on the IBM Personal Computer and compatible systems, interacts with most word processing programs but is not intended to replace a word processor, according to Leigh Marriner, Broderbund marketing director.

A drafted document can be imported directly to For Comment from Micropro International Corp.'s Wordstar, Wordperfect Corp.'s Wordperfect and Ashton-Tate's Multimate, Marriner said. ASCII files can also be moved into For Comment format. The document within For Comment is then passed among editors, who can insert their comments line by line on a variable-size split screen with the original document.

A cover sheet precedes the document, showing which reviewers have commented and when. Password protection is available for reading some comments or making changes.

Each writer's comments are identified within the document, and the end product can be consolidated. The author can directly transfer text between the split screens, avoiding rekeying. "It saves a lot of rekeying time, but it's also helpful to see comments in print instead of handwriting," said Mary Mann, central processing manager for Field and Associates, a Burlingame, Calif., consulting and auditing firm and an early tester of For Comment.

Mann said she used the program to coordinate revisions of manuals and track large audits among three or more people and that she took advantage of an on-line search for parts of a document. Sometimes, however, several comment-filled versions of a report can nearly fill a floppy disk, Mann added.

"We all think 360K bytes are a lot, but you could run out of disk space with a large document," said Jeff Kurtock, an attorney with Lewis, DaMato, Brisbois and Bisgaard in San Francisco, who also tried an early version of For Comment.

A network version that accommodates up to 16 authors is available for $995. The program is not copy protected. It also includes a tutorial disk. A demonstration disk is available from Broderbund for less than $10.

Broderbund's Marriner said For Comment is aimed at work groups with personal computers that do cooperative editing and document preparation. "We didn't want to come out with another mainstream application," she added. "We wanted to

See DOCUMENT page 26

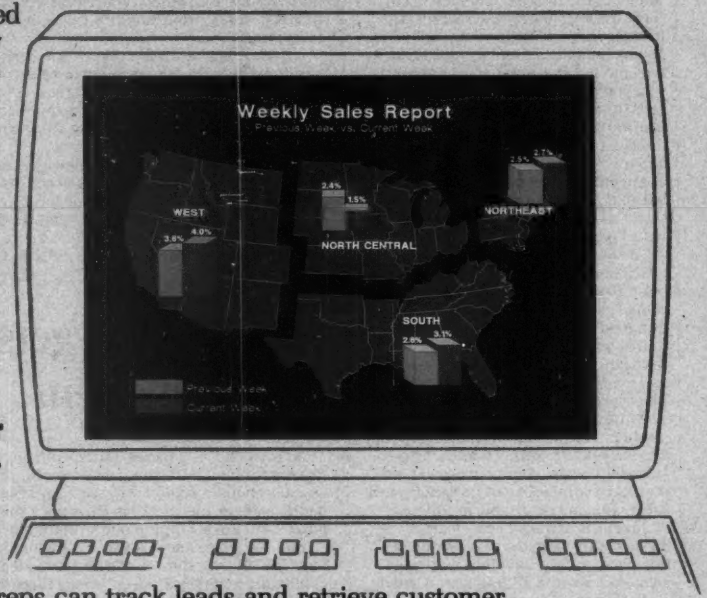
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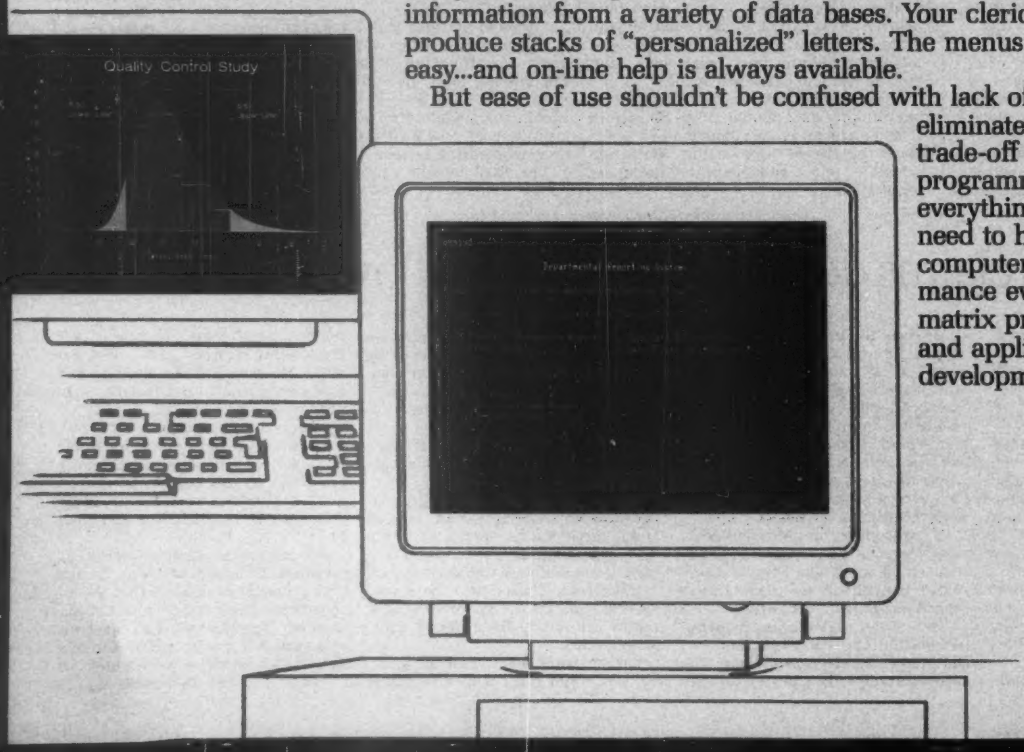
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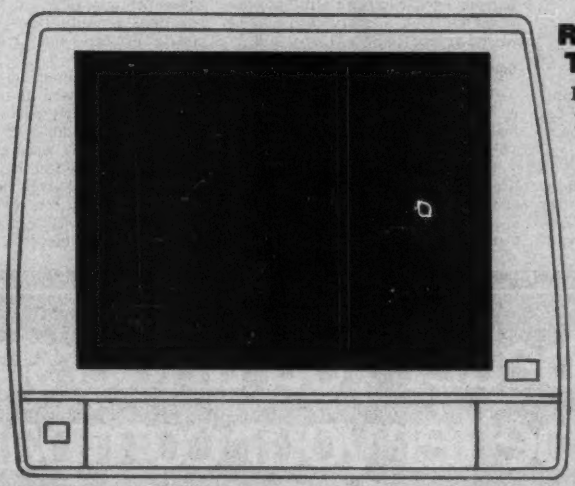


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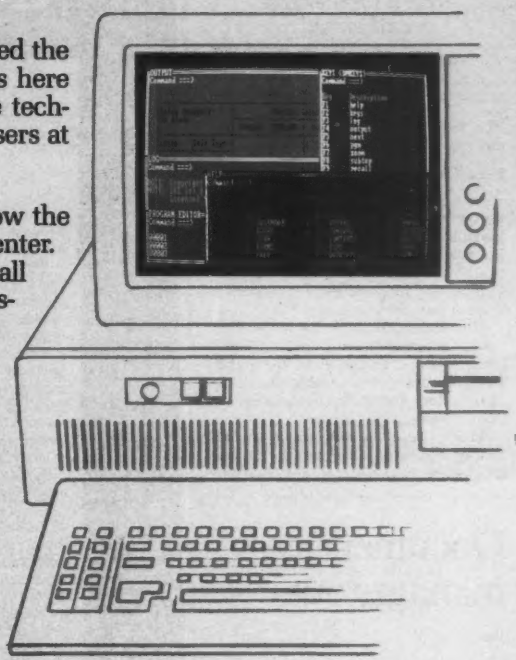


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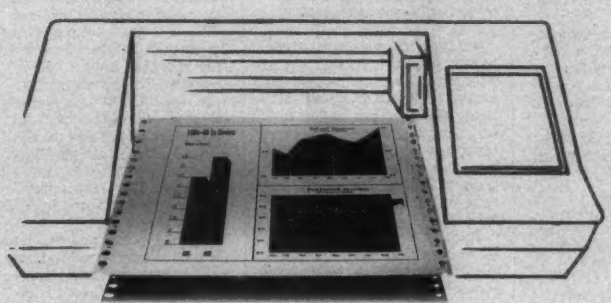
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Epson unveils laser printer, targets HP-dominated mart

By Peggy Watt

TORRANCE, Calif. — In an attempt to compete with Hewlett-Packard Co.'s dominant Laserjet systems, Epson America, Inc. last week announced a compact laser printer priced at less than $2,500.

Epson's GQ-3500 uses a Ricoh Corp. engine and runs on a Motorola, Inc. 68000 microprocessor at 8 MHz.

It uses a Epson page-printer command language set that is compatible with Epson's ESC/P, used with dot matrix systems, and has features to accommodate additional graphics, page formats and forms, said Dennis Cox, group product manager for Epson Peripherals.

The GQ-3500 prints at 300 dot/in. and can also emulate the HP Laserjet Plus and Diablo Systems, Inc. 630 ECS through optional integrated-circuit cards, priced at $169.95 each.

> ***'We're offering equivalent performance to an HP Laserjet Plus with a smaller size and price.'***
>
> — Dennis Cox
> Epson Peripherals

Page description language

The Epson printer does not currently support a page description language, such as Imagen Corp.'s Document Description Language, recently adopted by HP, or the Apple Computer, Inc.-endorsed Postscript from Adobe Systems, Inc.

However, Cox said Epson considers its offering to be a low-end laser printer system and intends to expand the line upward by adding more sophisticated graphics capabilities in later models.

The printer is scheduled to be available in the first quarter of 1987 and will be shown at Comdex/Fall '86 in Las Vegas, Cox noted.

Epson claimed the GQ-3500's 45-second warm-up time and first output time of 22 to 25 seconds makes it faster than many systems on the market.

Page-per-minute output

The printer produces six copies of an original page per minute, slower than most Canon, U.S.A. engine-based systems, including the HP Laserjet's eight page-per-minute output.

Cox pointed out that Epson offers more memory than many other laser systems, with 470K bytes of user memory, two font-card slots and seven built-in fonts. More will be available through integrated circuit cards next year, he added.

The basic unit can print one half-page of graphics at 300 dot/in. and, with an added 1.5M-byte memory expansion card, can print a full page of graphics. That memory card will be priced at less than $500, Cox said.

Smaller size

The GQ-3500 is also slightly smaller than most laser printers on the market, measuring 15 9/10 by 8½ by 16½ in.

Epson rates the printer's engine life at 180,000 copies. The input tray can hold 150 sheets, plus another 250 sheets with a optional second tray. Output can be face-up or face-down.

The GQ-3500 can also print in any of several colors by changing the toner cartridge, Cox said.

"I think its reasonable that some corporations will switch" from HP to Epson printers, Cox said. "Many corporations already have Epson dot matrix printers and Epson Equity computers.

"The laser printer is a logical extension to the Epson line, and we're offering equivalent performance to an HP Laserjet Plus with a smaller size and price," he continued.

HP is acknowledged by most market research and even competitive printer manufacturers to have cornered more than 70% of the corporate laser printer market.

Document manager out

From page 23

enhance a mainstream product." For Comment can also make printouts at any point, with overstriking and underlining showing deletions and additions in the document and the comment section.

"If you're involved in a lot of writing or documentation in an office environment, the concept is great," said Tim Bajarin, consultant with market research firm Creative Strategies International of San Jose, Calif., who has been testing the product. He said the closest equivalent product was Note-It from Turner Hall Publishing, which lets readers make margin comments in a document, but does not have as many layers of review comments as For Comment. "It's a narrow application but for the market that needs it, there could be a lot of demand," Bajarin said.

The better you understand the better your company c

The MIS perspective.

For years text management software has received scant attention from MIS.

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And third, start evaluating text management systems and vendors without delay. You can begin that evaluation today with a look at INQUIRE/Text—the most comprehensive, proven text management software system on the market.

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Traditional corporate information systems do a great job managing structured data. Unfortunately, the information most needed by decision-makers is often unstructured—embedded in the text of documents such as letters, reports, and contracts. Because this material has traditionally been beyond the reach of online systems, access to it has been slow, tedious, and error-prone. Word processors and office automation systems, for all their other merits, have been practically useless in making the actual information content of documents available online.

A text management system fills this void by providing highly sophisticated facilities for online index, search, and retrieval of information in stored documents. With a text management system, users can pinpoint specific pieces of information within vast volumes of text—instantly. And once they've found the information, they can edit, combine, and report it with complete flexibility.

Traditionally, the biggest text management users have been in industries that are subject to extensive regulation and/or frequent litigation. Now others are taking advantage of the systems' capabilities for a broad range of corporate information management tasks. And high on the list of these tasks is competitive intelligence gathering for senior management.

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INQUIRE/Text runs on IBM and compatible mainframes under MVS/TSO, MVS/CICS and VM/CMS.

Okidata rolls out its first laser printer, enters PC modem fray

Claims Laserline 6 supports three users

By David Bright

MT. LAUREL, N.J. — Okidata Corp., best known for its dot matrix printers, recently introduced its first laser printer and personal computer modem.

Okidata claims the Laserline 6 printer is aggressively positioned, providing design and software features not formerly available at its $2,195 single-user starting price. Three users can share the printer at a price of $865 each, adding to the unit's cost-effectiveness, according to Okidata.

The printer is compatible with a wide range of software, including Lotus Development Corp. 1-2-3, Microsoft Corp. Word and Micropro International Corp. Wordstar 2000, according to Okidata. In addition, Okidata says the 17- by 25-in. unit fits easily on a desktop or in a crowded office.

The 6 page/min printer features a choice of three plug-in modules, including one for supporting three users, one providing Hewlett-Packard Co. Laserjet compatibility and one for HP Laserjet Plus compatibility. The printer includes 15 resident, typeset-quality fonts.

Additional fonts are available in optional cartridges.

The multiuser module automatically switches from computer to computer to receive print data. Both the multiuser and Laserjet Plus compatibility modules provide extended graphics and forms overlay capabilities.

All three modules come with either a parallel or a serial RS-232C interface. Okidata also claims that the Laserline 6 prints true bold and true italics, rather than printing each character twice to obtain bold and slanting each character to simulate italics.

A 128K-byte buffer is standard on the Laserline 6 and can be expanded to 512K bytes for loading additional fonts and forms overlay macro commands.

The drum and toner come in snap-in cartridges. The printer's input paper tray holds 150 letter- or legal-size sheets. An optional tray with a 550-sheet capacity can be used in conjunction with the standard tray.

Listing at $1,995, the Laserline 6 should be available in November. The $200 basic module will be available at that time, and the advanced and multiuser modules will be available in February for respective prices of $400 and $600.

Okidata claims that its Okitel 1200 external modem has been designed to adjust to poor-quality telephone lines. Priced at $449, the Hayes Microcomputer Products, Inc.-compatible modem transmits at either 1,200 or 300 bit/sec.

The Automatic Adaptive Equalization feature looks at telephone line characteristics and automatically adjusts the modem's filters to bypass line interference, thereby allowing data to reach the personal computer without being distorted.

Designed for use with either Touch-Tone or rotary-dial telephones, the Okitel 1200 includes autodial and autoanswer capabilities and automatically determines the transmission speed of incoming calls.

The Okitel 1200 modem is scheduled to be available at dealerships this month.

In other news, Honeywell Information Systems Italia (HISI) also announced two multiple-function dot matrix printers. Both of HISI's printers are intended for such business applications as word processing and graphics. The $599 4/20 and the $849 4/21 both print 200 char./sec. in draft mode and 40 char./sec. in letter-quality mode.

HISI said it "spent a considerable amount of time" making the printers compatible with the IBM Personal Computer character set.

Televideo file server out

SUNNYVALE, Calif. — Televideo Systems, Inc. has announced two products for sharing departmental resources: a network file server and a dual-mode PC terminal.

"Multiuser systems and personal computer networks are becoming more and more pervasive in small offices and departments within corporations because they provide a cost-effective means for users to share data and resources," said Jim Alexander, senior vice-president of sales and marketing.

Built around Intel Corp.'s 80286 microprocessor, the PM/286 Network File Servers support Novell, Inc.'s Advanced Netware-286 network operating software and can support up to 24 IBM Personal Computer workstations. The file servers, which start at $8,495, will be available in mid-November.

Televideo said the $629 PC Station costs one-third less than average personal computers and takes up one square foot less of desk space.

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Javelin's price is all right

From page 23

it did nasty things like putting hidden files on your hard disks — and a $695 price tag. This is a little like competing in Olympic track and field events wearing hiking boots.

Unlike other vendors, which would apparently prefer being dead to being right, Javelin listened to what its customers were saying and eventually responded. Copy protection happily went out the door with Release 1.1 a few months ago. That left the big price tag as the only real impediment to success.

On Oct. 14, Javelin dropped the other shoe, announcing a special promotional price of $99.95 for the first 10,000 packages sold starting on that day. According to Javelin, the price will go back to $695 after that. I doubt that, but I think it is reasonable to assume Javelin will take the price back up somewhat after the promotion.

So if you'd like to own a really magnificent analytical tool that you can buy at a rock-bottom price, I'd recommend you run out and get a copy quickly. Javelin is one of the best designed analysis and modeling programs to emerge in recent years. And for just under $100, it is an affordable and complementary companion to more traditional spreadsheet programs.

Unlike a spreadsheet, Javelin "knows" about the type of data it is working with. It performs numerous higher level operations on data types of the sort typically used in financial analysis and modeling.

For example, Javelin has extremely handy features for dealing with time series variables. This not only makes it easy to create such variables and input their values, but also makes manipulating them a snap. You can tell Javelin whether a variable is daily, weekly, monthly and so forth. Quarterly and annual roll-ups can be done with automatic facilities in Javelin.

Javelin also knows about consolidations. So creating reporting, analysis or modeling systems where it is necessary to combine charts accounts from multiple departments or subsidiaries is easy. Another powerful feature is a built-in facility for handling table look-up calculations. Tax tables, commission schedules and the like, which can be real monsters in traditional spreadsheet programs, are easily handled in Javelin.

Another feature unique to Javelin is that it keeps the entire analytical model in an internal representation that can be approached from a number of views, including a spreadsheet view. But unlike a spreadsheet program, in which the entire model is kept "inside" the spreadsheet, Javelin uses one or more spreadsheets as a way of viewing and manipulating the underlying model.

This can also be done through report and graph views. In each case, the data can be not only represented but manipulated as well. For example, functions can actually be created in a graph form by manipulating the actual shape of the graph, rather than by specifying numeric values.

Additional options let you view the underlying model as a system of equations. This is a tremendously useful alternative for many applications and makes verifying the structure of the model much easier than any spreadsheet I have seen.

Javelin is not a direct competitor with spreadsheet programs, although there are many overlapping applications. Where it really stands out, however, is in doing financial analysis in general and modeling in particular.

Javelin is one of the most exciting and innovative programs I have seen in the past few years for IBM Personal Computers and compatibles. At $99.95, it is a terrific value that will become a highly valued addition to at least 10,000 users' software shelves.

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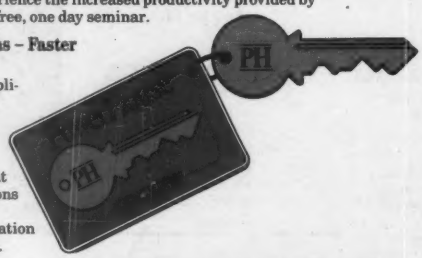
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HP module speeds file access

From page 23

150 HP-UX operating system commands, including a complete C compiler and symbolic debugger, text editors, formatters and a spelling checker, data communications capabilities, maintenance tools and system utilities.

Through the use of shared libraries and code compression techniques, the module packs 4.8M bytes of disk-based Unix into 2M bytes on the ROM card.

Fast file access

One major benefit of the ROM module is fast file access time because files are stored in ROM, rather than on a hard disk, according to Dick Thompson, product manager at HP's Corvallis, Ore., Workstation Operation.

Another is the use of integrated circuits, which provides reliability when the Integral personal computer is moved from place to place, he added.

The ROM module will also provide a tool for training HP-UX programmers, who can use the system at home and the dial up to a host for accessing files or for testing and executing programs they develop, said Keith Marchington, an HP product marketing manager in Corvallis.

The ROM module plugs into one of the Integral PC's I/O slots or one of the slots of an HP 82904A bus expander.

The ROM module will be available for order on Nov. 1.

SYSTEMS & PERIPHERALS

HARD TALK
Peter Cooperstein

Big Blue kills a golden goose

In the past few years, IBM has guided customers away from its own two-year Monthly Lease Charge (MLC) plan and instead encouraged either outright purchase or third-party leasing, under which a leasing company buys equipment from IBM and leases it back to the user. The jury is still out on whether this will prove a smart long-term strategy for IBM.

What was Big Blue's motivation in the move away from MLC? After all, this version of "rent to own" was once the major acquisition vehicle for IBM users. Now it is not even offered on the most current IBM equipment. The most obvious answer is that IBM wanted internally generated funds to finance its huge investments in new plants and equipment, and direct and third-party purchases allowed IBM to collect up front instead of monthly.

But although cash flow was an important motive, it certainly is not the full explanation. After all, during this same period, IBM introduced its IBM Credit Corporation (ICC) and made ICC a major third-party leasing company offering primarily longer term leases. When a user transacts a purchase-leaseback through ICC, doesn't the cash go in one IBM pocket and out the other?

A more subtle reason for encouraging purchase was that it gave IBM a chance to recognize its revenues sooner. Prior to 1982, IBM's stock was sluggish. Not only did a higher percentage of purchase business make Big Blue's financial statements look better — when the revenue from converting the existing leases to purchase was added in, the results were even more impressive.

See **Bill** page 32

Cooperstein is vice-president of marketing for Western Marketing and Financial Corp., a San Rafael, Calif.-based leasing and brokerage firm.

TI fills out System 1000 line

Unix-based system created around Business Pro chassis

By James Connolly

AUSTIN, Texas — With an acknowledgment that its IBM Personal Computer AT-class Business Pro system used an oversize chassis, Texas Instruments, Inc. last week announced a Unix-based 24-user system that incorporates the same enclosure.

TI officials said the announcement of the System 1100 is proof that the company planned for the Business Pro to take on a larger role than as a personal computer when it was introduced in 1985. "We are now giving our users a road map of where we are going," commented James S. Bradley, marketing manager for the TI Computer Systems Division.

TI also announced its 945 Intelligent Workstation, which was designed for use with all of its minicomputers or as a stand-alone personal computer in the way that Digital Equipment Corp. designed its Vaxmate workstation.

The System 1100 is the low-end product within the TI System 1000 Series of Unix-based multiuser computers that was introduced with the System 1500, then known as the Business System 1500, in March. TI officials promised to continue supporting the company's older product lines — the Business Systems 300, 600 and 900, which run TI's DX-10 operating system — and stressed that peripherals from the older systems will operate with the System 1000.

However, the System 1100 announcement represented a continued TI shift away from the use of proprietary software and hardware in favor of industry-standard products.

In the case of the System 1100, the industry-standard hardware is a 12-MHz, 16-bit Intel Corp. 80286 microprocessor and the software is based on TI System V, a TI version of AT&T Unix System V. The System 1500, to which TI added a low-end model last week, uses Motorola, Inc.'s 68020 processors.

Noting that 90% of TI computers are sold through value-added resellers (VAR), Bradley said those VARs depend upon the marketability of their own software. "Once a VAR develops an application, he would like to use that solution on big machines, small machines, whatever. He also wants to know that if he invests in peripherals, they can be used with those various machines," Bradley said.

"Adoption of standards is probably the thing that the user cares most about. The

See **TI** page 31

GA Pick-based Zebra line evolves

By Donna Raimondi

ANAHEIM, Calif. — General Automation, Inc. (GA) has announced two additions to its Zebra multiuser business computer family.

The systems appear to be rounding out GA's Pick Systems Pick-based line of business computers, which got a major boost earlier this year with a number of introductions, according to a consultant who follows the Pick-based systems market.

Chandru Murthi, consultant at Opsys in San Francisco, said, "The company has a good reputation in the Pick world, and this expansion is something they needed to do to appeal to a wider segment of the market."

The 32-bit Zebra 5820 is based on a 20-MHz implementation of Motorola, Inc.'s 68020 processor, a spokesman said. The system comes with the SMA Standard Pick operating system, Pick's Access Information Management and Retrieval Language, Accusoft, Inc.'s Accu-Plot business graphics software and Raymond-Wayne Corp.'s Compu-Sheet spreadsheet package.

The basic 5820 costs $54,975 and comes with 2M bytes of main memory, 130M bytes of formatted Winchester disk storage, 16 serial I/O ports, one parallel printer port, a ¼-in. dual-density tape drive and a battery backup unit. Memory can be added in 2M-byte increments up to 6M bytes, at $6,000 per increment. The system can be expanded to 80 users at a cost of $2,300 for each eight-port addition.

Two other models of the 5820 cost $62,750 and $68,750 for the base models. The 5820-003 has a 274M-byte disk drive and the 5820-005 has a 410M-byte disk drive. All models can increase disk space

See **ZEBRA** page 30

INSIDE

Cygnet releases a robotic optical disk jukebox/**30**

CIE Systems adds high-end business system/**30**

EMC offers mass storage subsystem for HP 3000 computers/**31**

NEW THIS WEEK

- Fujitsu increases its line of Winchester disk drives

For more on this and other new products, see pp. 83-89.

INSTANT ANALYSIS

"Connectivity among computers is a marriage that links together something new, something old, something borrowed and, like everything else, ultimately leads to something Blue."

— Pauline Alker, president of Counterpoint Computers of San Jose, Calif., on office automation and connectivity.

DATA VIEW

Optical disk drives

Report forecasts continued market growth through 1989

Unit	1985 Shipments in thousands	Forecast 1986	1987	1988	1989
Read only	8.3	30.9	110.3	290.5	600.7
Read/write less than 1G byte	1.4	10.7	58.0	144.5	331.0
Read/write more than 1G byte	4.9	12.1	24.6	46.5	87.3
Total, all drives	14.6	53.7	192.9	481.5	1,019.0
Percentage unit growth	+630.0%	+267.8%	+259.2%	+149.6%	+111.6%

Information provided by 1986 report from Disk/Trend, Inc.

MAI Basic Four adds systems, tools, seeking more vertical market share

By David Bright

TUSTIN, Calif. — Hoping to increase its presence in vertical markets, MAI Basic Four, Inc. recently introduced products including two superminicomputers, a multiuser supermicrocomputer, a set of integrated software tools and a networking scheme for linking supermicrocomputers.

MAI Basic Four, claiming more than 34,000 customers worldwide, targets such areas as sewn products, manufacturing, retail and health care. Construction property management is also targeted by the firm.

Designed for a large-business environment, the MPX 9110 and the single processor MPX 9120 superminicomputers support up to 84 users and 116 users, respectively. Since they are compatible with the company's MPX predecessors, the two systems "satisfy the customers' growing needs for more powerful, expandable systems," MAI Basic Four President William Patton Jr. said.

Containing proprietary 32-bit CPUs, the systems are said to offer a

See **MAI** page 32

Cygnet releases robotic optical-disk jukebox

By Donna Raimondi

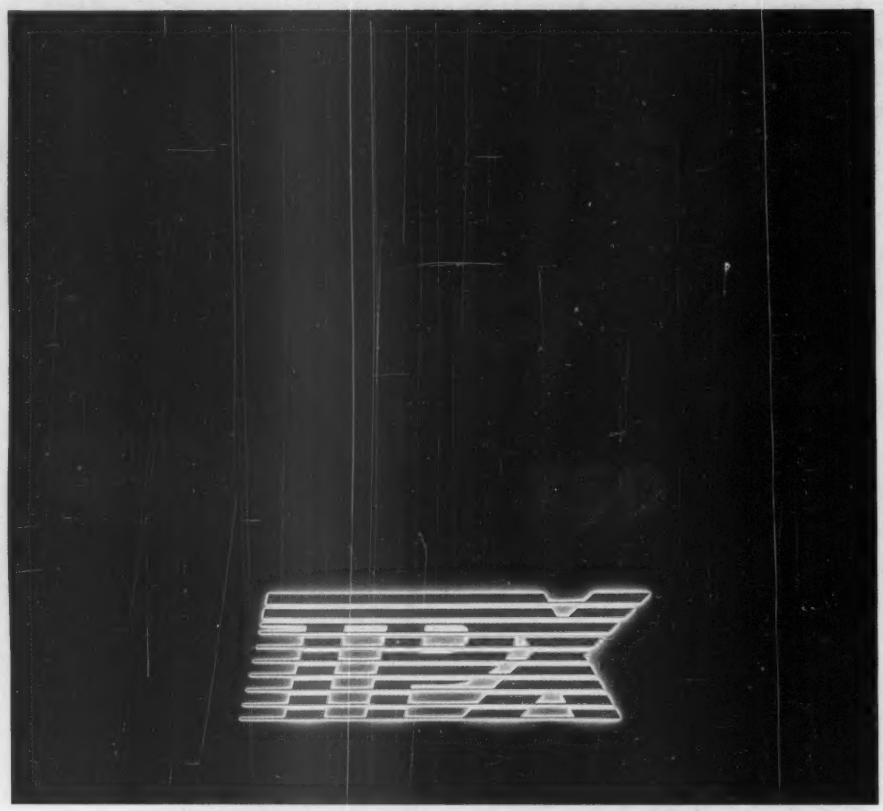
SUNNYVALE, Calif. — Cygnet Technologies, Inc. has announced an optical-disk jukebox file storage and retrieval subsystem. The Series 2000 Smart Jukebox system manages the storage and retrieval of large files including text, images or graphics. It is targeted to micrographics, office automation and data processing markets and will be sold through OEMs and value-added resellers.

The box is similar to the musical jukeboxes, according to Robert Katzive, vice-president of the Los Altos, Calif.-based Disk/Trend, Inc., which publishes an annual study on storage products. The box is likely to be used by companies with large data bases, he said, including insurance companies, large banks and government organizations.

The Series 2000 consists of 3-year-old Cygnet's prior product, the Series 1800 Expandable Jukebox, which is a robotic optical-disk handling system for 12-in. optical disks. The 1800 has space for up to five optical disk drives and up to 141 optical disks.

The unit can be configured with one drive and up to 141 disks, a spokeswoman said. Each disk can store up to 2.6G bytes of information, for a possible 365G bytes on a system. Another combination is five drives and fewer — up to 101 — disks, allowing several users to access information at the same time, according to a Cygnet spokeswoman.

In addition to the 1800, the 2000 includes proprietary file-server software; a Motorola, Inc. 68020-based file server engine; Ethernet, Transmision Control Protocol/Internet Protocol and File Transfer Protocol communications protocols; and the AT&T Unix System V operating system. The 2000 configuration allows the stand-alone 1800 product to manage the information put on the disks. A basic unit, not including drives or disks, costs approximately $200,000, although the company does not sell to end users. A typical configuration, set up by a systems integrator for a user, would run upward of $250,000, the spokeswoman said.



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CIE expands high-end line

By Stanley Gibson

IRVINE, Calif. — Adding to the high end of its product line, CIE Systems, Inc. recently introduced the CIES 680/300, a business computer system that can reportedly handle up to 64 users. CIE Systems' previous high-end product, the CIES 200, handled up to 40 users.

The 32-bit multiuser business computer system offers a choice of three operating systems, including CIES/Pick, Unix-compatible Regulus and RM/COS.

It is based on the Motorola, Inc. 68020 CPU running at 16.7 MHz and offers disk and tape storage components that provide up to 2.7G bytes of disk storage.

"This system provides the capacity and performance of most high-end minicomputers, but at one-half to one-third the cost," maintained Warren Blossom, vice-president of CIE Systems' Computer Systems Group.

"We saw a lot of pressure in the Pick market to keep going up. Our intentions are to go higher and to announce a new product before the end of the year," Blossom claimed.

The CIES 680/300 can be equipped with between 2M and 8M bytes of random-access memory (RAM), 256K bytes of on-board cache memory, up to four 689M-byte hard disk drives and a 6250 GCR ½-in. tape drive. It can also be configured with 24 to 64 serial ports.

A basic configuration, with 2M bytes of RAM, a single 689M-byte hard disk drive, tape drive and 24 serial ports costs $83,995.

The system is available immediately, according to the vendor.

In addition to the CIES 680/300, CIE Systems announced Version 3.3 of the CIES/Pick operating system.

CIE Systems also said it will introduce, in the first quarter of 1987, an asynchronous distributed multiplexer that can connect up to 128 asynchronous terminals to the CIE N680/300.

CIE 680 Systems are sold through CIE Systems' international network of Pick value-added resellers and dealers. CIE Systems is a subsidiary of C. Itoh Electronics, Inc.

Zebra line from GA evolves

From page 29

by adding three additional drives. For example, the 5820-003 can add three 274M-byte disk drives at $18,000 per drive, and the 5820-005 can add three 410M-byte disk drives at $24,000 per drive.

Also announced was the Zebra 3820, which costs $31,995 in a basic configuration with 2M bytes of memory, 67M bytes of formatted disk storage, a ¼-in. streaming tape drive, 16 serial ports, one parallel port and a battery backup.

A 3820 model with 140M bytes of disk storage is available for $36,996. The model's storage can be increased by adding three 140M-byte increments at $10,500 each.

TI fills out its 1000 line

From page 29

biggest complaint of users is, 'Why don't you guys make things that run together?' " added Bradley, who claimed proprietary machines in the small business and departmental classes will continue to come under pressure from industry-standard systems. He noted that the two exceptions might be IBM and DEC, which are powerful enough to set their own de facto standards.

Market analyst Michael Goulde of The Yankee Group commented, "Given the reliance of TI on VAR channels, it is a good move. VARs are looking for industry-standard hardware that they can add value to."

Goulde noted that TI is not the first vendor to offer 80286 processors — most commonly offered in PCs — in larger systems, and that Altos Computer Systems supports 20 connections in an 80286-based system. "Given the fact that Altos has been selling boxes fairly well, TI should be able to do it. The 286 has a lot of oomph to it as long as you're not running DOS," Goulde said of TI's decision to offer Unix on the System 1100 rather than Microsoft Corp. MS-DOS that runs on the Business Pro.

He said small business computer and departmental system users do not care which operating system they are using since it is the job of their VARs and systems developers to work with development shells and to provide user interfaces.

Goulde speculated that TI plans to allow some type of field upgrade from the 80286-based systems to the more powerful Intel 80386 successor, although Bradley declined to comment on that possibility.

The System 1100 supports up to 24 physical connections and up to 16 concurrent users. Main memory ranges from 1M to 15M bytes, and unformatted hard-disk capacity ranges from 48M to 280M bytes. It also features an Intel 80287 coprocessor and 32K bytes of cache memory with zero-wait states, according to Bradley. Like the System 1500, the System 1100 runs Micro Focus, Inc.'s Cobol System V.

TI officials said the growth path of their product line now stretches from the Business Pro, which supports a maximum of eight users, through the System 1100, supporting up to 24 users, to the System 1500, which allows up to 128 connections. The earlier Business Systems 300, 600 and 900 supported a maximum of 40 users.

An upgrade from a Business Pro to a System 1100 is accomplished through an exchange of the system board and the enclosure face plate, Bradley noted. He reported that the price range for the Business Pro runs about $2,000 under the System 1100 price range. The System 1100, which will be available during the first quarter of 1987, carries a suggested list price range of $13,895 to $18,995.

The newest model of the System 1500 family, the 1515/1, is the first uniprocessor in the System 1500 line. It is the entry-level model, fitting into the product line just above the System 1100. It supports 30 or more users with a 16-MHz 68020 microprocessor and incorporates TI's NU Bus. The maximum memory is 4M bytes, and maximum disk storage is 3.6G bytes. It carries a suggested list price of $40,000.

In addition, TI lowered the suggested prices by $10,000 for the three older members of the System 1500 family. Those models, including two, three or four processors, had ranged from $70,000 to $110,000.

The 945 Workstation is based on an 8-MHz Intel 8088-2 microprocessor. Maximum memory is 640K bytes. The hard-disk capacity is 20M bytes; floppy-disk capacity is 360K bytes. Bradley said that with the ease of integration with TI multiuser systems, users can specify when ordering a 945 which TI system they plan to connect it to and TI will ship the appropriate cabling kit.

The 945 carries a suggested list price of $1,595. It is also available without the emulation capability at $1,495.

EMC system cuts I/O clogs

By James Connolly

NATICK, Mass. — EMC Corp. has introduced a mass storage subsystem that it claims reduces I/O bottlenecks in Hewlett-Packard Co.'s HP-3000 computers.

The subsystem reportedly features Motorola, Inc. 68000-based disk cache processor cards and Winchester disk drives that can be configured to provide up to 1.6G bytes of storage in a single EMC cabinet.

In addition, EMC announced plans to develop memory products for the first of HP's Spectrum-class systems, the HP-3000 Series 930 computers. EMC officials said they expect to offer Series 930 memory during the first quarter of 1987.

EMC Product Manager Joseph Gately said EMC's intelligent disk subsystem features one disk cache processor card per drive. The card uses a 68000 CPU and a 4M-byte cache utilizing 120-nsec, dynamic random-access memory chips. "Our mass storage subsystem features a caching algorithm that is actually more efficient than that of the 7933/5XP drives from HP. The high-speed cache allows our EMC subsystem to perform dramatically faster than traditional removable drives from HP, which are configured with only 1M-byte cache capability," Gately said.



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IB

Big Blue kills a golden goose

From page 29

Conversion revenue, however, is unsustainable, and without that steady stream of monthly payments, IBM's quarterly earnings became more volatile.

In 1982, when IBM's purchase strategy hit the market, I was an IBM financial marketing representative. My responsibilities included encouraging purchase as opposed to MLC and conversion of leased equipment to a purchase or purchase-lease-back basis.

But I discovered that after the initial two-year period, users rarely cancelled the MLC contract. Customers would, without much examination, allow this equipment to extend automatically for a year at a time; in fact, significant amounts of equipment had been on MLC for as long as six to 12 years.

In effect, IBM was being paid two to three times the original purchase price for machines on MLC. Why would Big Blue kill a golden goose? Also, what has been the marketing impact of IBM's move away from its two-year lease plan?

IBM was once a one-price-for-everyone supplier. Now, with the push toward purchase, the company offers Volume Purchase Agreements (VPA). Volume suppliers have always offered volume discounts, but IBM has been much more clever than most.

VPAs typically extend for one to two years, so IBM reps can usually convince users to commit to discount levels and quantities of machines that take them a year or so to fulfill. Thus, VPAs can allow IBM not only to beat the competition initially, but to keep out competitors over a period of time.

VPAs are even effective against competition from used IBM machines. Toward the end of a VPA, users are often forced to pass up used machines at significantly lower prices in order to fulfill their VPA commitments.

But IBM's move toward purchase has also had a negative marketing impact: It is now more difficult for many customers to acquire new IBM hardware. Before, many DP managers were able to order IBM machines and sign the MLC Lease Schedule with little, if any, internal approval. The competition's sales reps never even got a chance to ask, "What if . . .?"

Today, things aren't so smooth.

The purchase alternative presents the user with a dollar outlay that is, of course, initially much higher than that under MLC, and that also means an additional impact on the customer's financial statements.

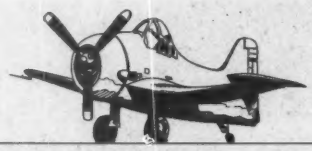
As a result, higher-ups and financial officers often get involved where the DP manager once acted virtually alone.

If the third-party leasing route is chosen, the customer's third-party leasing coordinator (a job few companies had in the MLC era) typically solicits bids from ICC and other leasing companies.

And since many of these outside lessors also have used IBM machines to sell, users come away with a greater awareness of bargains in used IBM equipment. The result of all this flurry is that new IBM machines do not roll into the users' shops as easily.

IBM users were happy with MLC. Many of those same users would still enjoy having that alternative, even if it were priced less attractively. MLC's pricing was secondary to its ease and the intuitive appeal of rent-to-own.

The question remains whether IBM's broad move toward purchase will prove to be wise. But in any case, the Monthly Lease Charge need not — and should not — have been killed.



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MAI Basic Four adds systems

From page 29

fourfold performance and connectivity increase over the earlier systems while remaining about the same physical size. Like the earlier systems, the new machines run the company's BOSS/VS operating system.

The MPX 9110 is priced from $100,000 to $200,000. The MPX 9120's pricing starts at $155,000 and ranges to more than $300,000.

Based on the Motorola, Inc. MC68020 microprocessor, the MAI 3000 supermicrocomputer system is positioned for new vertical market users and as an upgrade to the MAI 2000 system. Supporting up to 34 users, the MAI 2000 runs the company's BOSS/IX Unix-like operating system.

Complete system pricing begins at $24,890. A typical system with 3M bytes of random-access memory, a 120M-byte disk drive, a 43M-byte cartridge backup tape drive, 18 serial ports, one parallel port, 10 terminals, two 120 char./sec. dot matrix printers and the BOSS/IX operating system costs $46,750.

The integrated software package runs on the MPX family of systems as well as the MAI 2000 and MAI 3000 systems. It includes six MAI Business elements, including Word, Math, Graph, Exec, Mail and Data. On the MPX systems, the package lists for $6,000; on the MAI 2000 and MAI 3000 systems, the price is $4,500.

Based on the X.25 International Standard Protocol, the new Magnet software enables the interconnection of thousands of MAI 2000 systems worldwide on a wide-area network with speeds up to 9.6K bit/sec.

COMMUNICATIONS

DATA STREAM
Elisabeth Horwitt

PC LANs seek corporate ties

The IBM Personal Computer local-area network (LAN) has gotten mighty sociable of late. In addition to finding new ways to link their PC LANs together — via CCITT X.25 networks, for example — market leaders have lately announced plans to support industry networking standards like X.400 and Transmission Control Protocol/Internet Protocol (TCP/IP). This will enable users to hook departmental PC LANs into larger corporate networks and to mainframe and minicomputer hosts as well.

None of this comes as any great surprise — savvy PC LAN vendors are well aware that interconnectivity has become their key to survival. Users want corporatewide electronic mail systems, host gateways and network bridges that allow them to access data bases and peripherals without worrying about their physical or logical location. At a growing number of companies, enterprise networking has become a strategic priority — and the stand-alone PC LAN is following the stand-alone PC into obscurity.

A clear sign of this trend's growing significance is the fact that Novell, Inc. is getting nervous. The PC LAN vendor has successfully competed against IBM's Personal Computer Network by billing Netware as the "Cadillac" of PC LAN systems.

But while Novell continues to dominate the market for powerful file servers and multiuser applications, competitors 3Com Corp. and Banyan Systems,

See **PC** page 36

Horwitt is Computerworld's *senior editor, communications.*

FCC considers deregulation

Users fear competition will not stop cost hikes

By Mitch Betts

WASHINGTON, D.C. — Data communications managers are concerned that deregulation of local exchange carriers, an idea now being promoted by Federal Communications Commission Chairman Mark S. Fowler, will benefit only the very largest big-city corporations.

While several states' public service commissions are already experimenting with deregulation, Fowler recently unveiled a much more sweeping proposal for a three-year trial period of total deregulation in states that volunteer to participate. During this time, local companies could enter new businesses and raise or lower rates without government approval.

Several managers and consultants told *Computerworld* that they fear local deregulation would add new uncertainties to the already confusing marketplace. They predicted that the divested regional operating companies would charge high rates for local services, especially in nonmetropolitan areas with few or no competitive offerings. Under deregulation, these companies are likely to reserve cut rates for corporate giants that threaten to go to a competing service or bypass the local system altogether, said Anthony F. Mattera, manager of electronic data interchange for Champion International Corp. in Stamford, Conn.

If permitted to start new business ventures at will, Mattera added, these companies are likely to subsidize ventures with revenue from the captive users on the local loop.

Lionel Gillerman, manager of network technology for McDonnell Douglas Aerospace Information Systems Co. in Cypress, Calif., said he has deep concerns about local deregulation. "If the local monopoly disappears, in theory we could have great competition. In practice, I don't envision this," he said.

August H. Blegen, executive director of

See **FCC** page 34

Burroughs supports terminal-to-host twisted-pair wiring

By Elisabeth Horwitt

DETROIT — Promising greater flexibility and less expense in equipment installation and relocation, Burroughs Corp. last week announced support of structured twisted-pair wiring connections between its host computers and terminals.

"We believe that twisted pair offers our users the best combination of price and performance," said James Atkins, vice-president and general manager of the company's Communications Group.

The structured wiring scheme outlined by Burroughs typically consists of four twisted-pair wires that connect to a standard telephone jack and can support up to 2M bit/sec. transmission rates with great-

See **BURROUGHS** page 34

Banyan servers gain X.25 link

By Stanley Gibson and Elisabeth Horwitt

WESTBORO, Mass. — Banyan Systems, Inc. recently unveiled Release 2.0 of Virtual Networking Software (Vines) with faster response time and enhancements that allow its local-area network (LAN) servers to exchange files with IBM Personal Computers running PC Network software.

The release also supports Nestar Systems, Inc.'s Arcnet LAN, along with optional software that allows Vines servers to exchange files over a CCITT X.25 packet-switched network.

"Previous releases of Vines could coexist but not communicate with PC Network," Banyan Product Manager Bruce Pierson said. With Release 2.0, "users can access files either on an IBM PC acting as a

See **BANYAN** page 34

NEW THIS WEEK

- Network General Corp. offers portable protocol analyzer for the IBM Token-Ring network

For more on this and other new products, see pp. 83-89.

INSTANT ANALYSIS

"IBM plans to create a consistent software interface to screen the user from incompatibilities among its different architectures. That's like the old joke about the GI who is ordered to 'Do something about that pile of garbage' — and puts a fence around it."

— Brian Jeffrey, director, International Technology Group, Palo Alto, Calif.

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FCC considers deregulation

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the Association of Data Communications Users in Bloomington, Minn., said his group supports a "gradual, orderly march toward local deregulation" with ratepayer safeguards. The catch, he said, is there should be some degree of competitive local service before deregulation begins.

Many states have begun partial deregulation. According to a survey by the National Telecommunications and Information Administration, 35 states permit price flexibility for local exchange carriers, and 15 states have passed bills authorizing utility commissions to deregulate or detariff services deemed competitive.

At a recent press briefing, Fowler argued that although telephone rates may rise in a deregulated environment, new services would make greater use of the local loop's capacity, perhaps reducing rates.

The deregulation trials would be subject to three conditions: The telephone companies must maintain universal service by subsidizing residential rates with general tax revenue; an open network architecture (ONA) must be implemented to ensure that potential competitors can provide local services as efficiently as the telephone companies can; and accounting safeguards must be instituted to prevent anticompetitive conduct. The state trials envisioned by Fowler could not begin until sometime after 1989 or 1990, because the ONA will not be approved until then.

Banyan servers gain X.25 link

From page 33

server under PC Network or on a Vines proprietary server."

In addition, users will be able to share information and resources across multiple PC Networks by adding a Vines server to each LAN, Pierson claimed. IBM designed PC Network to "provide communications within, but not between, clusters of PCs," he said.

In contrast, Vines' global naming feature enables PC Network users to access files, mail and peripherals on any server on a multi-LAN system, he added. For example, a user could make a file available to users throughout the corporation by transferring it from a local PC to the nearest Vines server.

The X.25 server-to-server connection is "the next piece of our communications puzzle that we have solved," Pierson said. Vines servers running the optional software become gateways between networked PCs and X.25 network services like Telenet Communications Corp.'s Telenet. "You also have the option of running an asynchronous link to such services, but that only supports rates of up to 9.6K bit/sec.," Pierson said. An X.25 connection supports up to 64K bit/sec., he added.

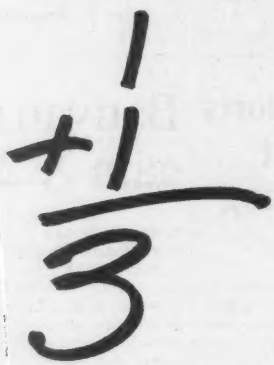
The server connects directly to an X.25 network through a synchronous modem, eliminating the requirement for a local packet assembler/disassembler, which costs $4,000 to $5,000, a Banyan spokeswoman said. A server running Vines 2.0 can support up to 64 virtual circuits. The X.25 software package costs $2,495 and requires use of the X.25 Communications Adapter, priced at $1,000.

Also announced was the 3270/BSC bisynchronous option for Vines 2.0, which allows a Banyan server to emulate a remote 3274 cluster controller with up to 32 simultaneous sessions per line. This allows any PC on a Banyan network to act as a 3270 terminal without requiring a terminal emulation board. The 3270/BSC host connection supports speeds of up to 9.6K bit/sec. The 32-session option is priced at $2,295, and the 64-session option costs $2,995.

Release 2.0 provides faster response time for IBM PCs operating software on the server, Banyan said. A data-caching feature permits the server to keep selected programs in main memory for quick access.

Release 2.0 also allows incremental tape backup and permits the installation and diagnostics of systems from a remote location. Network management has been enhanced to include disk usage statistics, providing information that will allow users to balance disk usage for optimal network performance, Banyan said.

Customers under support contracts will receive Release 2.0 at no charge. Otherwise the software upgrade is priced at $995 per server.



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NYNEX
Business Information Systems

Burroughs backs twisted pair

From page 33

er speeds possible over limited distance. Among the advantages of the scheme, Burroughs said, are the ease with which terminals can be moved and added, the medium's high availability and low installation cost and the fact that the same wiring supports voice/data communications.

Many companies already have such a scheme installed, according to Burroughs. Customers can use previously installed IBM, AT&T or Northern Telecom, Inc. twisted-pair wiring schemes to connect Burroughs terminals and hosts, Burroughs said. The company said it will continue to support all existing interconnections using Two-Wire Direct Interface cable, cluster communications cable and other Burroughs-specified cables.

Burroughs plans to announce initial twisted-pair product offerings later this year.

Micro-to-mainframe software automates data entry jobs

Uses PC's 'intelligence' to enter and check info

By James A. Martin

MORRISTOWN, N.J. — AT&T recently announced a micro-to-mainframe software program that, in addition to providing standard IBM 3278 terminal emulation, is said to automate the data entry functions required in downloading and uploading data from the microcomputer, freeing the end user to perform other duties.

"All the normal things you can do from a 3270 terminal, Escort does for you automatically," said AT&T spokesman Barry Campbell. "It increases productivity and eliminates errors, which makes it particularly useful for those using terminals in repetitive data entry tasks into the host."

Designed for AT&T PC 6300 and other Microsoft Corp. MS-DOS systems, Escort Connectivity software features an automatic script program that simulates a manual, interactive session between an IBM mainframe and an end user.

By using The Command Language, a fourth-generation programming language packaged with Escort, scripts can be developed that automatically enter and check data, submit batch jobs to the mainframe, test on-line applications and analyze response time of transactions, AT&T said. The software resides entirely on the microcomputer.

Not just a dumb terminal

Escort "makes it possible for a PC to use its intelligence instead of being just a dumb terminal when talking to an IBM host," Campbell said. Instead of having to key in everything during a session, the user sits back while Escort calls up the host, dials into the session, uploads and downloads data, ensures that data is in the right format and logs off, he added. Escort does not, however, translate mainframe files into a microcomputer format, he admitted.

Unlike some micro-to-mainframe products that "just offer terminal emulation and raw hardware and software connections," Escort's automatic script programming "provides a friendly end-user interface between the PC and the mainframe, and that sounds like a big advantage," said Jean Yates, an AT&T analyst and vice-president of International Data Corp. in Palo Alto, Calif.

Escort works with a range of terminal emulation boards, including Irma from Digital Communications Associates, Inc. The cost of MS-DOS-based Escort Connectivity is $695. A multiuser version will be available for AT&T Unix-based microcomputers later this year.

Networking tool widens the RT's LAN accessibility

SAN JOSE, Calif. — A networking software package recently introduced by Excelan, Inc. allows the IBM RT Personal Computer to communicate over an Ethernet local-area network using Transmission Control Protocol/Internet Protocol.

The product, called the EXOS 8016-01, enables RT PCs running the AIX operating system to communicate over Ethernet via Excelan's Intelligent Ethernet Controller Board.

The networking software was developed jointly with Interactive Systems Corp. of Santa Monica, Calif., which created AIX. It enables RT PC users to communicate with Digital Equipment Corp. VAX minicomputers, NCR Corp. Tower Series systems, Sun Microsystems, Inc. workstations and IBM Personal Computers and compatibles.

The EXOS 8016-01 package is intended to allow engineers and designers to perform computer-aided engineering tasks, such as schematic capture, on the RT PC and then upload the data at high speeds to host computers for logic simulation.

R&D facilities

RT PCs equipped with the EXOS 8016-01 for the first time have "the appropriate communications facilities" for engineering research and development environments, according to Excelan Vice-President of Marketing Subhash Bal.

The interface enables RT PC workstations to be part of an R&D network that typically includes PCs, engineering workstations and DEC VAX machines for number-crunching, he added.

The EXOS 8016-01 software package includes applications and utilities such as FTP, a high-speed file transfer program; Telnet, a terminal emulation program; R-utilities, a set of remote Unix networking utilities; and Unix-to-Unix mail delivery.

The complete package, which includes the EXOS 8016-01 software and an Intelligent Ethernet Controller Board, is priced at $1,295. The product is available in small quantities now, with volume shipments scheduled to begin in December.



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PC LANs seek corporate ties

From page 33

Inc. have "leapfrogged ahead of Novell" when it comes to interconnectivity, according to David Terrie, president of Boston-based Newport Consulting.

"Novell doesn't do internetworking yet, and it feels real pressure to respond to 3Com and Banyan, who have," Terrie says. Both companies offer multitiered naming systems and routing schemes that enable their servers to act as gateways between multiple LANs.

Closing the gap

Novell currently does not but is clearly determined to close the gap, as several recent announcements show. At the Networld '86 conference in Dallas, Novell unveiled its Universal Network Architecture Strategy, promising to provide connectivity "to the maximum range of computer services."

In the last few weeks, Novell and the Interlan division of Micom Systems, Inc. have jointly announced the Netware TCP Option, which permits PCs on a Novell Advanced Netware LAN to communicate through a Netware 286 file server to PCs, Unix workstations and VAXs using TCP/IP protocols on an Ethernet LAN.

Novell also announced Message Handling Service, a development tool for interfacing various communications protocols with Novell's network system. While the initial product only supports asynchronous protocols, future releases will support X.400, X.25, IBM's Systems Network Architecture (SNA) and Professional Office System and Digital Equipment Corp.'s All-In-1, Novell claims.

Novell's competitors, meanwhile, have not been idle. For example, Banyan has just implemented X.25 support on its Virtual Networking System server software and promises support of the X.400 Open Systems Interconnect electronic mail protocol in the future (see story page 33). 3Com has linked into IBM's Token-Ring and Apple Computer, Inc.'s Appletalk.

IBM strategy

And meanwhile, what of IBM? Competitors and analysts claim that PC Network is fit only to connect a small cluster of workstations. This is not surprising, considering that IBM's networking strategy is based on SNA, not MSNet.

IBM's current priority, industry analysts claim, is to develop LU6.2-based internetworking applications, such as message routing and resource naming. These applications will run in an SNA environment over the IBM Token-Ring.

> ***Analysts claim that PC Network is fit only to connect a small cluster of workstations. This is not surprising, considering that IBM's networking strategy is based on SNA.***

Eventually, Terrie says, IBM will provide similar internetworking capabilities for PC Networks. "It's a question of priorities; first IBM will link PC Network to SNA." The vendor has already provided a way for multiple PC Networks to interface with its SNA-based network management system, Netview.

IBM would prefer that customers use their existing SNA backbones to link PC Networks to each other — and to "network servers" that happen to be System/36s or low-end 370 hosts, such as the recently announced 9370.

The concept of a group of PC LANs sharing data and peripherals primarily on PC-based servers, with only an occasional call to the corporate mainframe host, is naturally not a big favorite with Big Blue. But customers may feel differently, especially since the new 386-based servers will provide viable alternatives to low-end minicomputers.

As long as IBM sees the world through SNA-colored glasses, PC LAN vendors — especially those with viable corporate connectivity solutions — will continue to fill an important market niche.



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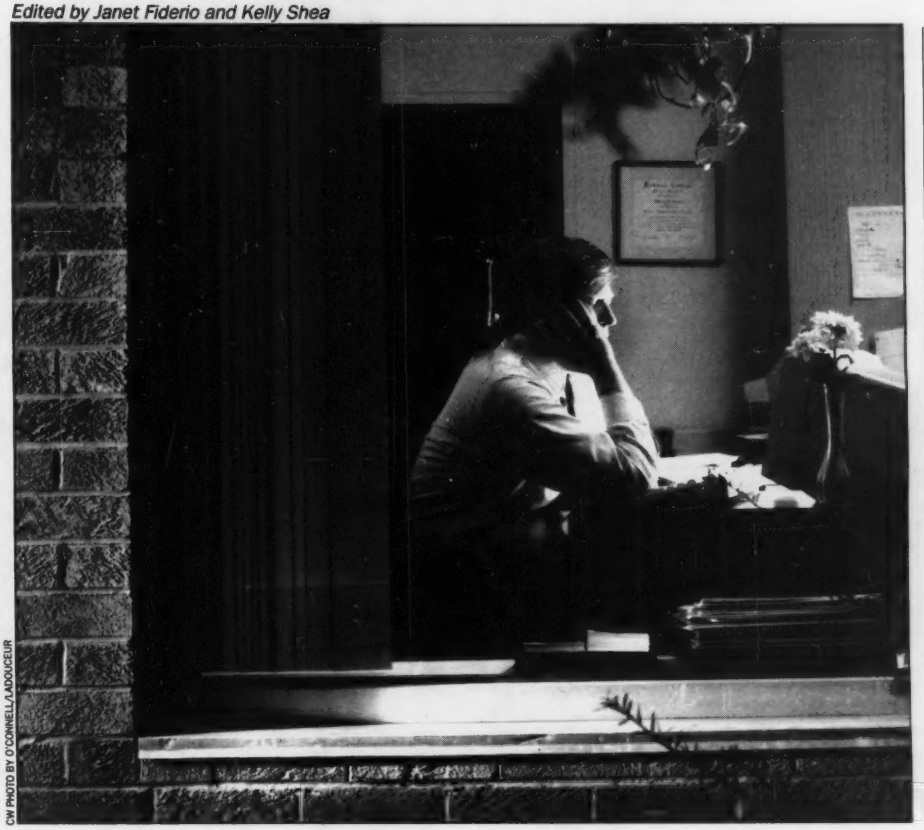
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Executive Report

Edited by Janet Fiderio and Kelly Shea



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Executive information systems

Put strategic data at your CEO's fingertips

By DAMIAN RINALDI and TED JASTRZEMBSKI

Do you know the first 10 questions your chief executive officer will ask upon returning from a three-week vacation? Will he question sales results? Inventory levels? Cash balances? New order activity? Currency fluctuations? Stock market indexes?

Better yet, do you help to provide the answers to your CEO's questions? Will your system quickly and easily correlate, track and display the specific information that CEOs look for?

Executive information systems (EIS) claim to do just that. An offshoot of decision support systems (DSS), EIS applications primarily monitor and track strategic corporate business. They typically consist of easily operated, custom-designed executive-to-system interfaces that connect to both external data sources, such as the Dow Jones News/Retrieval service and internal corporate data bases.

Prepackaged EIS products currently include Comshare, Inc.'s Commander EIS and Pilot Executive Software, Inc.'s Command Center software. In addition, users are taking advantage of widely installed DSS products like Execucom Systems Corp.'s IFPS and Thorn EMI Technology, Inc.'s FCS to build EIS applications, or they are custom designing proprietary systems.

But the key to an EIS's success, whether it be a proprietary, packaged or DSS-based system, is its elegantly simple presentation of the most important pieces of corporate information, which are defined by the senior executives themselves.

EIS users insist that the systems are more than the latest product rolled off the software industry's indefatigable acronym generator — that they are valid products providing the right information at the right time to a management staff overwhelmed by paper reports.

Packaged or homegrown, then, these systems affect more than the executives who use them. Many EIS are helping to define a new, more responsive role for information systems professionals.

By building an EIS that highlights a company's critical success factors in a way that is accessible

By setting up an EIS that highlights a company's critical success factors, MIS can position itself as a vital, involved participant in the running of the corporation.

Rinaldi is a senior software consultant and Jastrzembski is director of software research programs at International Data Corp., a market research firm based in Framingham, Mass.

Putting data at CEO's fingertips

Continued from previous page

to senior management — as opposed to delivering mounds of computer printouts — MIS can position itself as a vital, responsive, involved participant in the running of the corporation.

Ronald Neese, director of systems development and data administration at Houston-based waste disposal company Browning Ferris Industries, uses Pilot Executive Software's Command Center.

Neese, who runs a VM-based version of Command Center on an IBM 4381 mainframe, says, "The EIS gave us an entree into the executive suite that we didn't have. Now we are involved in the decision making process in a way we never were before."

When an EIS project bears fruit, one of the benefits achieved is the enthusiasm it builds in the system's sponsors. Genrad, Inc., a Waltham, Mass.-based manufacturer of test equipment, beta-tested Pilot's Digital Equipment Corp. VAX version of Command Center last year in the offices of the CEO, the chief financial officer and five senior managers. The company used the EIS to develop a monthly operations review that included all financial spreadsheets and exception reporting.

Although still weighing his EIS options, Mitch Brown, Genrad's manager of corporate MIS, considers the systems to be a resource that "puts real capability in the hands of senior executives." Brown does not expect to see the productivity gains achieved with office automation systems at lower levels of the organization, but he says that the EIS "can help senior management be more effective. And at that level, even 5% payoffs can be highly leveraged."

Definitions of executive information systems are as varied as the organizations that are researching, buying or building them. EIS constantly change and evolve in response to the dictates of the competitive concerns of the executives they support. Browning Ferris' Neese found that an iterative approach to EIS development was best. "We deliver new functions every 30 to 45 days," Neese says. "The system is never done; it needs to change with the needs of the executives."

Shell Oil Co. wove a strong web of executive support by drawing on the best aspects of several different tools from different vendors. S. J. Malkani, staff financial representative for the Information Planning and Development Group, brought together a "democratic EIS" by drawing from mainframe applications using Execucom's IFPS and Impressionist, Nomad2 from D&B Computing Services Co., Comshare's System W and Commander EIS, Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase III and Issco's Tellagraf.

Malkani credits the information gateway component of Comshare's Commander EIS with making the integration possible. The gateway expedites access to existing applications on the personal computer and mainframe.

The system is currently being used by the general manager of finance, a vice-president, two general managers and six to eight senior managers to monitor current business conditions, daily reports and price trends and histories.

Success has had its price for Malkani's group at Shell, however. "The executives want more and the pressure is on for more widespread access to the system," Malkani says. In the works is an enhancement to allow direct access to IBM's IMS-based live data as well as SQL data under the CMS operating system.

The Platts oil industry data base is available through Shell's current system with more outside data services planned. There has also been a call for more history and different views of the information. Secretarial workstations are being added to the system to support electronic document distribution.

Using the information gateway in an IBM net-

Continued on page 42

User Profiles

Gillette buys its EIS, Firestone builds

By MICHAEL SULLIVAN-TRAINOR

While it may be difficult for MIS departments to find the time and programming resources to build an executive information system (EIS) from scratch, buying an off-the-shelf EIS package that satisfies all of a company's needs is also nearly impossible.

"There are very few choices when looking for software to design status access systems, and virtually no packages are designed to create ad hoc query systems for executives," says David DeLong, an executive support systems researcher at MIT in Cambridge, Mass.

DeLong adds that the major consideration that should influence whether an organization either builds or buys an executive information system is user needs. "Different executives want very different things from computer-based support systems," he says.

To support executives who wanted an EIS that identifies, tracks and analyzes data critical to the success of the company, Don Palmer, controller of Gillette Corp. of Boston, implemented an advanced system that incorporated status monitoring with ad hoc query capabilities.

Palmer, responsible for providing an EIS for all of Gillette's executives in North America, invested in Command Center, an EIS shell made by Pilot Executive Software, Inc. of Boston, and then set his staff to work making the system meet the corporation's requirements.

"We found it would be very expensive to build a system internally in terms of the development costs. Instead, we leveraged the vendor's technical expertise and acquired a product that was 80% or 90% of the way there and took our resources to bring it the rest of way," Palmer says.

Originally, Gillette began building its own system in 1981 using a graphics package. But before the system was too far along, the company decided it would be more cost-effective to obtain an EIS product. This decision led to an agreement in 1984 for Gillette to become a beta-test site for Pilot's Command Center.

According to Palmer, opting for an off-the-shelf package freed the MIS support staff from development chores and allowed them to work with users and the vendor to enhance the system. In addition, Palmer says, the acquisition will allow the company to easily shift to another vendor's product, should one prove superior to Command Center in the future.

Currently, between 25 and 35 Gillette executives access Command Center using IBM Personal Computers linked to a Digital Equipment Corp. VAX 8600. Information available through the EIS includes the Dow Jones News/Retrieval service, national and foreign news accounts, corporate financial results, market share information, sales figures and customer service information.

The system is built around critical success factors, which are indicators of how well business is going. Ninety-eight percent of this information is displayed graphically. "Ease of access is an important feature. You really don't need to be familiar with a keyboard except in terms of transmitting electronic messages," Palmer says.

His staff made Command Center available as a menu item on the executives' personal computers, accessible after the user enters an appropriate password. The system menu is divided into external and internal categories, which can be examined further through the use of a mouse.

A key factor in the company's successful implementation of the package was the identification and preparation of the data the executives needed to access. "From the beginning, we saw EIS as a way of having a clearer insight on our performance against some key measures that were inherent in our whole strategic planning process," Palmer explains.

"For this reason, we spent a fair amount of time identifying what our critical success factors were and how to measure them, as opposed to simply taking the existing reporting system and attempting to replicate that on a PC. Once that was done, it was not a difficult process to accomplish the technical implementation," he adds.

However, to make Command Center accessible to the users, the company had to invest the programming time to enhance the user interface. Another drawback is that the system quickly consumes computer resources.

"It has utilized the existing resources more quickly than anticipated," Palmer says. He adds that the system formerly ran on a DEC VAX-11/785, but Gillette upgraded to the 8600 because of the demands of Command Center as well other time-sharing and data base access applications.



"We have provided ad hoc reporting for the executives that requires no knowledge of the programming language.'

— Ian Adams
Firestone Tire Co.

Ian Adams, manager of decision support for Microcomputing and Office Services at Firestone Tire Co. in Akron, Ohio, conducted a three-year project devoted to constructing an EIS with Express, a fourth-generation language made by Information Resources, Inc. of Chicago.

Using Express as the design environment enabled Adams's staff to provide Firestone's executives with capabilities that would not be available to them through a package currently on the market.

For example, the system includes built-in routines that will take question-and-answer responses from the executives and build them a customized report for their personal directories.

"We have provided ad hoc reporting capability for the executives that requires no knowledge of the programming language. With a product like Command Center, for instance, the executive would need to ask the decision support team to design the report for him," Adams says.

"I don't think a Fortune 500 company could contemplate setting up an executive support environment similar to the one we've created without providing several people to work on it full time, probably for several years. You're talking about total expenditures in terms of hardware and software that can certainly run into the

See SULLIVAN-TRAINOR page 42

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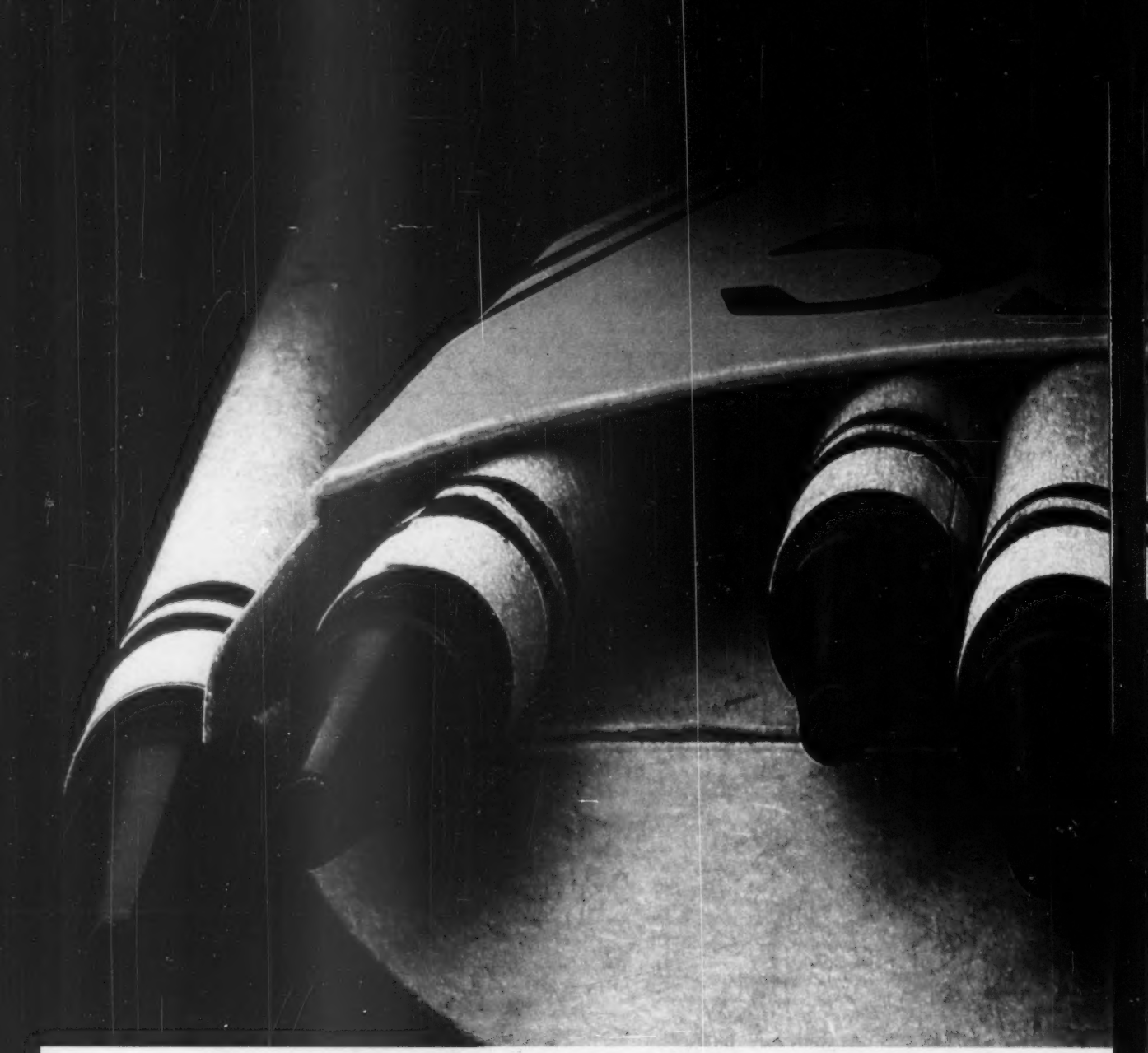
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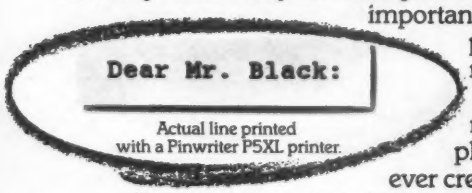
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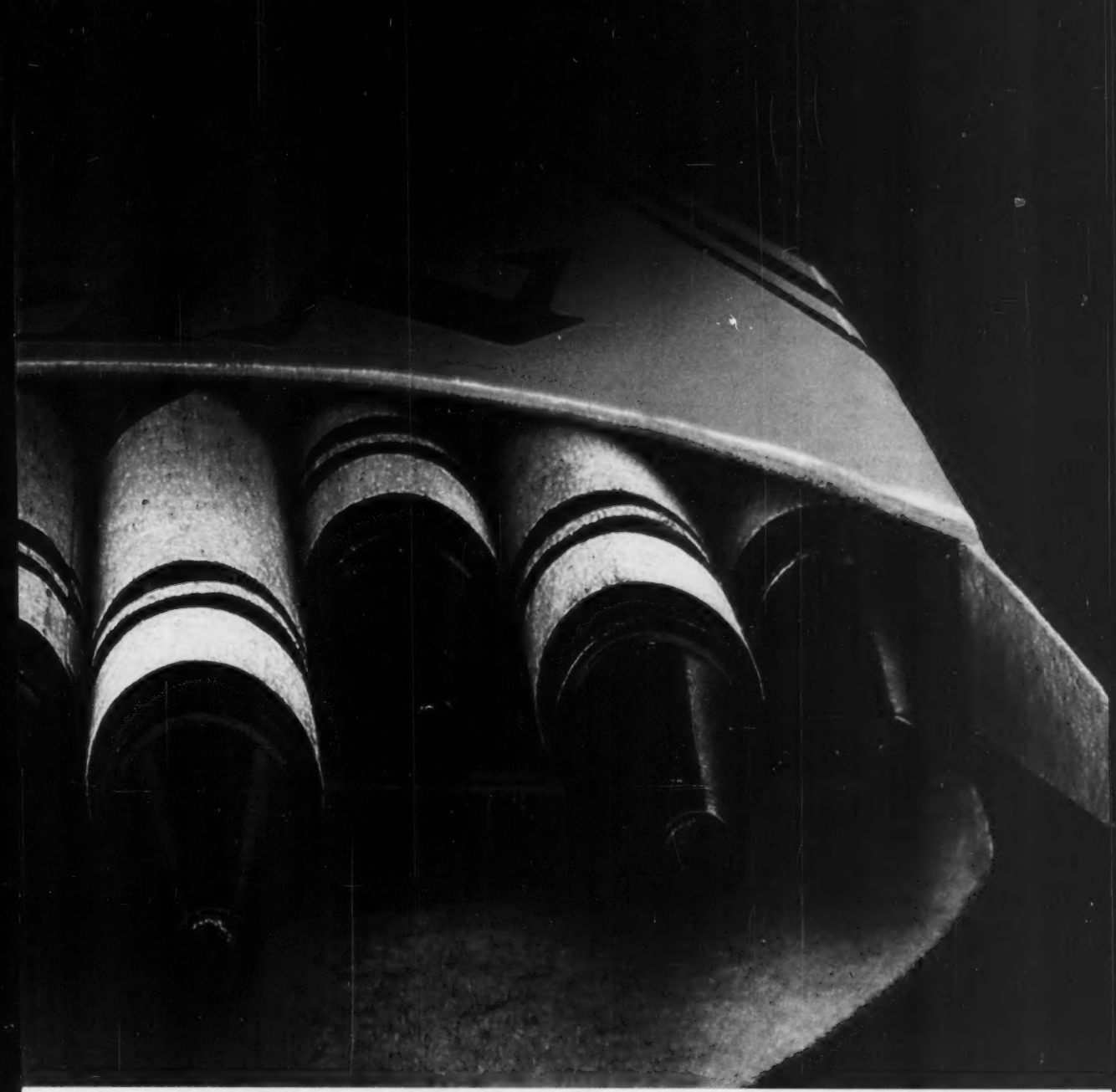
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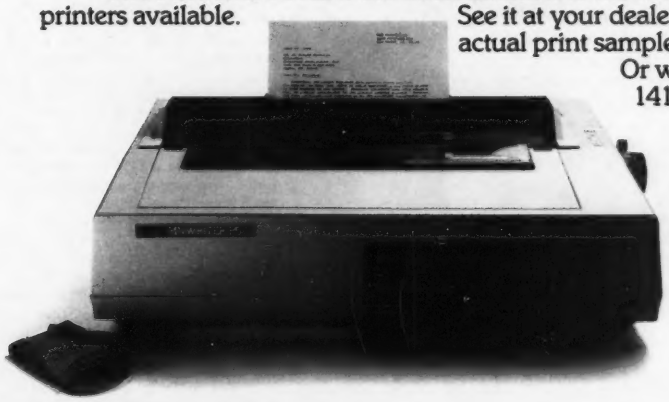


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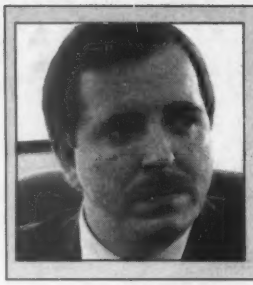
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Continued from page 38

work, documents from the EIS can be called up on the Personal Computer, updated using IBM's Displaywrite III and then put back into the EIS.

Another issue for Malkani was response time. Knowing that response time can be a serious implementation hazard when serving chiefs who are accustomed to quick answers, he brought all of Shell's available screens and supporting data to view within 20 seconds of a user command.

Companies have been known to dismiss EIS packages because they could not deliver the desired screen output in fewer than 30 seconds. So, much of the more recent EIS design progress has been directed at meeting the rigorous response time demands of hurried users without compromising ease of use.



'The EIS gave us an entree into the executive suite that we didn't have before.'

— Ronald Neese
Browning Ferris Industries

While the technical issues revolving around response time and integration of the EIS with existing systems are many, these issues are not the EIS developer's most overwhelming concern. Making the system easy to use, yet specific, is one of the developer's biggest challenges.

Blair Stephens, manager of systems administration at Dallas-based Mary Kay Cosmetics, Inc., evaluated the Pilot system while using the company's proprietary system.

The problem at the outset, Stephens says, "is that people don't realize that the EIS issue is several orders of magnitude more complex than traditional, routine DP production applications.

"EIS present a multidimensional problem," Stephens says.

"The greatest change in my attitude toward the EIS is my appreciation for the executive-to-system interface," he adds. "The level of importance of this issue can't be underestimated. You have to build a system that allows a person to grasp the information as well as the implications it has for his business decisions."

Because these systems are so complex, the executive-to-system interface design must be undertaken with great care and understanding of the executives who are to use it and the business that it will be used to monitor.

Northrup Corp.'s Aircraft Division's Tom McNeil, manager of the information service center, designed, with his staff, the company's executive information application with "the users right at our sides. That way we didn't encounter many objections to the design." Northrup, based in Los Angeles, uses an IBM 3081-based X-Edit system in the company's financial group.

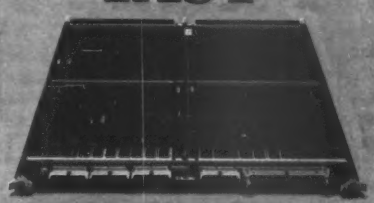
Developers must also look at the characteristics of the decisions being made at the executive level within their companies. Different people have different approaches to solving problems. The organization's structure and culture play a big role. Centralized organizations will have different problems than those with far-flung operations.

Resources, including hardware, data, software, money, staff time and so on, have to be allocated realistically. Even ergonomics becomes a

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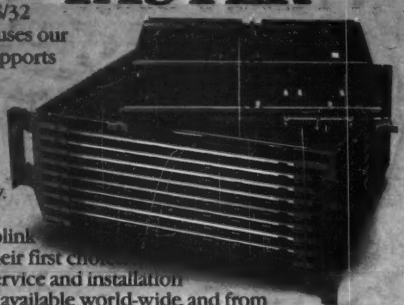


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millions of dollars over time," he says.

The impetus for Firestone's EIS development came from John Nevin, the chief executive officer who joined the company in 1979, and from Lawrence Burden, the corporate vice-president of MIS who had developed an EIS based on Express at Northwest Industries, Inc. of Chicago.

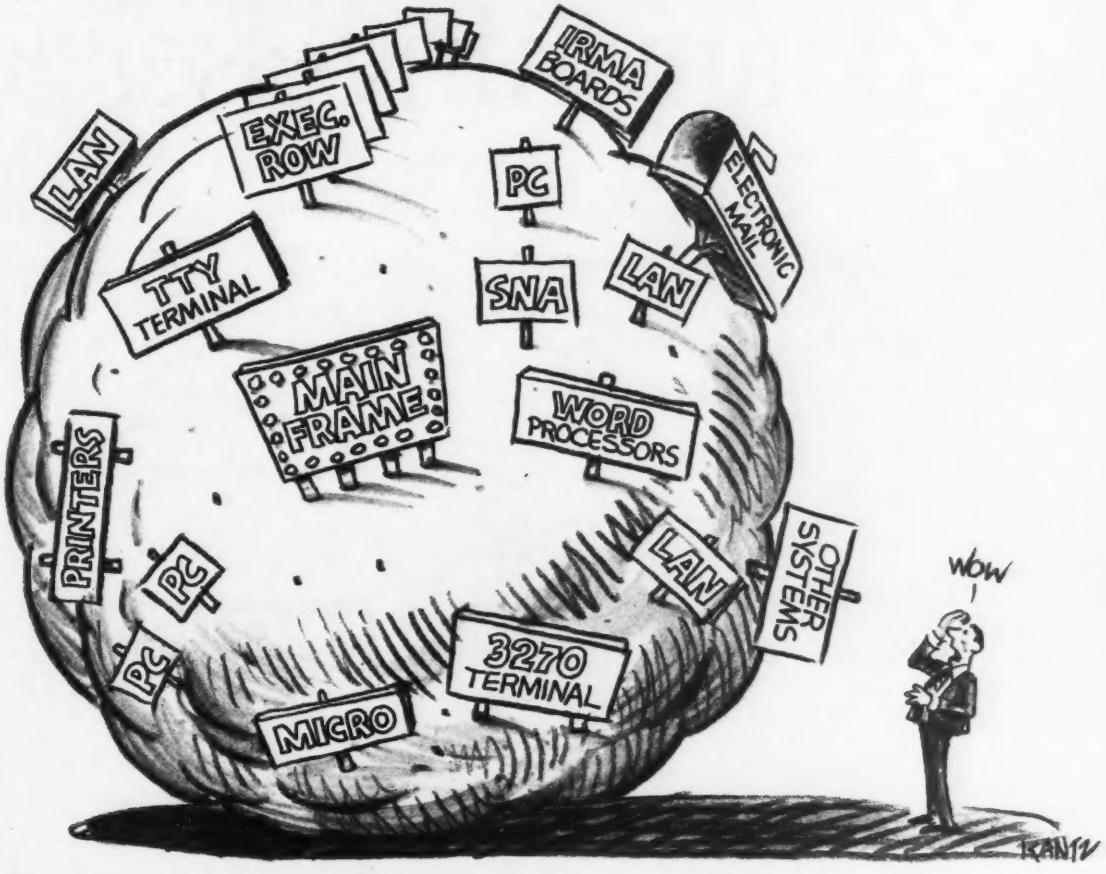
Built in 1982, Firestone's EIS has evolved over the years. Once composed of the Dow Jones News/Retrieval service and a historical data base, the system now includes a very large relational data base that can be accessed using color graphics and a large-scale budgeting and forecasting system.

Firestone's 20 executives access the system using IBM Personal Computers that are connected to an IBM 3033 mainframe.

The major difference between what Firestone has done and what is currently available on the market, Adams says, is that products like Command Center are good front ends for an EIS, but they are not relational data bases or financial modeling systems.

"Command Center assumes that all of that work is being done in the background by some other package or set of packages," he says. ■

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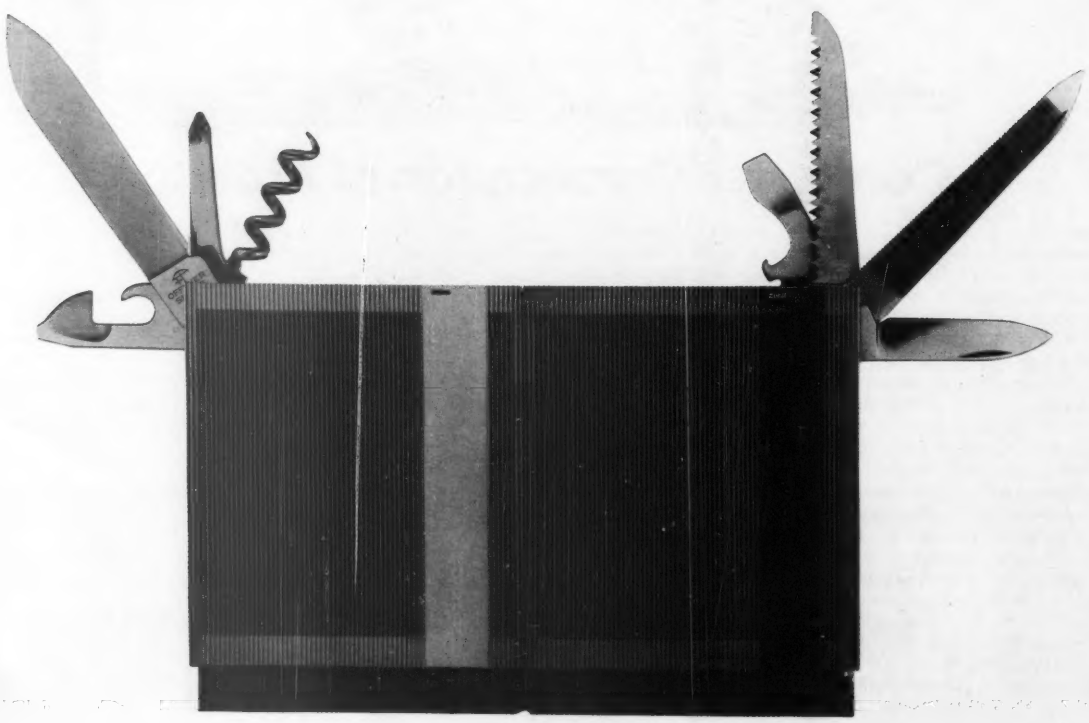
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Continued from page 42

prime consideration. And even though there is general agreement that graphics are among the most effective ways to present information to senior executives, this method has its drawbacks from a practical standpoint: Executives do not always have time to focus on graphs on a screen, and the PCs siting on top managers' desks do not always have graphics capability.

From a conceptual standpoint, an EIS developer has to be familiar with general systems theory, as well as the research that has been done on how decisions are made and how to communicate most effectively. Finally, there has to be an appreciation of the external environment in which the company and the EIS will operate.

Because the EIS is an evolving concept in the minds of both researchers and companies who have taken the first steps toward establishing it, users are squarely on the horns of a dilemma — should an EIS be a priority item on the MIS roster, or is the technology still too new and undefined?

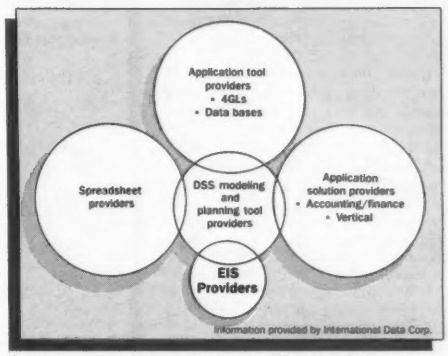
A major stumbling block in finding an answer to this question and deciding whether to go forward with an EIS lies in discriminating between executive information applications and executive information systems. A full-fledged EIS draws from multiple applications and multiple data sources, both internal and external.

By contrast, executive information applications, even if they are prepackaged for the consumption of senior-level executives and are automated, are single-function systems.

But one-dimensional executive information applications can lead users to full-blown executive information systems. In fact, a relatively simple application can lay the foundation for the more involved planning and discussion required to build an ongoing EIS and can help to ensure the MIS department's success with the larger project later.

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THE EIS VENDOR ENVIRONMENT



Some crossover occurs between EIS and DSS markets.

Interview

EIS evolution: Polaroid system poised to enter CEO's office

In 1981, Polaroid Corp.'s finance department proposed a top-level, worldwide financial reporting system. Five years later, the proposal has matured into an executive information system (EIS), poised to enter the office of Polaroid's chief executive officer.

The foundation of the system, an Information Builders, Inc. Focus data base, has integrity back to 1982. In its original batch-reporting form, the system incorporated financial data used by the controller and other finance executives.

In 1985, with the appointment of controller Graham Brown, the development of an on-line prototype began. Brown and system developer Robert Baldwin, director of corporate financial planning and analysis, designed an interactive EIS that allowed Polaroid staff to look at any combination of data for any period of time.

The finance group works in partnership with MIS, but the actual design and running of the system is the job of the financial analysts.

During the development of the new system, which runs on an IBM 3033 mainframe using IBM Personal Computers and Execucom Systems Corp.'s IFPS software, several problems arose. Although ideal for financial analysts, the system was too slow and too complex for the casual executive user.

Brown and Baldwin now address the issues of how to make the system easier to use and how to elicit faster response times.

Currently, in its final stage, the EIS consists of two levels. The top level is a focused analytical series of reports on the financial operations of the company — income statements, balance sheets and so on. The second is a limited selection of reports and time periods that summarize hard-copy and on-line reports so that the executive can focus on information of his choice.

Computerworld Senior Editor Janet Fiderio spoke with Brown and Baldwin about the executive information system's evolution.

Do you have complete trust in the validity of the data base and what adjustments must you make to meet your new executive users' expectations?

BALDWIN: There is absolutely no problem with the data base, it's clearly the accepted reference that Polaroid works from. As far as executive use of the system goes, clearly as we aim higher in the organization we meet different sets of expectations.

I'm not always sure as we go up into the organization if the technology is there today to give us the consistency that we're looking for. In other words, if we have a goal of seeing a report in, say, five to seven seconds, we might be happy to live with four to eight or four to 10, but we don't want it to be four to 50.

> ***'I can wait 35 or 40 seconds to create a report. But at the next level of executive reporting, that type of response time is death.'***
>
> — Graham Brown
> Controller

Another issue we face is the complexity of the system. In a batch reporting system, you ask for the report, and you get it. When you're on-line, the system is either up or it isn't, so the communications network is a concern.

But what's important is that if you want an EIS and if you want the president's attention, you've got to give him a quality product. It's got to work, and it's got to be easy to use. I'm not as concerned with reports or with data as I am with consistency, reliability, response time. I am concerned with the quality by which we deliver the information and how it all goes together. When it works great, it's fantastic.

BROWN: As a controller, when I am looking for data, I know that I'm trying to pull out three, four or five years' worth of records. It is acceptable to me, therefore, to wait 35 or 40 seconds to create a report.

When you go to the next level for executive-type reporting, that type of response time is death. You need a way of putting that data in almost instantaneously, or else you lose your audience.

You're working on response time problems right now?

BALDWIN: Yes, that's the biggest thing that we're trying to do — have something that is very, very fast, very reliable.

The current system is menu driven, but if you continue your work taking the system up into the executive offices, will it be graphics driven?

BALDWIN: Currently, the system is menu driven. Our problem with graphics is that they have to be executed from outside of the system. So it becomes a response time issue. We are currently beta-testing a product from Execucom to help us integrate our graphics.

How often are your reports updated?

BALDWIN: We intend to update the latest available forecast report — there's basically 12 of those in the year — each month and again for each quarter and yearly. We are at a point where that is totally automatic today. We are in the final debug phases, so that when we pass our information along, as a part of our routine, we would refresh the reports.

For reports on the analytical level we're trying to get to a point where basically within a day or two of closing off the data, this information is up there for the executive. We are in the process of working on the routines to automate 90% or so of these reports.

Our greatest restraint is time. I can design anything, but if I cannot integrate it into my organization so it can be out in a day or two, nobody wants it.

The way the system works is we have a number of view sets, which are periods of time in report form that the executive can go after — he can look at actuals, forecasts, forecast trends, or he can look at history. He can choose a report, choose what he wants to look at, exit the system at any time or return to the top menu. And if he happens to like anything, he can get a print in a large-size font — slide quality — on a laser printer.

One of the intentions of the system at either level is to be able to prepare for a meeting and, before you go, take whatever you want.

BROWN: We wanted to allow the executives to be able to go back and forth between forecasts and trends and some history. We don't just give them one view set at one point in time. If they want to look back into a prior quarter or look at a prior year, they can do that readily for the entire data base.

What additional reporting do you anticipate that your executives will request?

BROWN: I'm not sure there's any answer to that question yet. Our executives are basically getting detailed information on a monthly basis.

What we are doing with this system is taking that information and giving it to them in summary format so they can randomly access the pieces of it that they need at any given point in time.

I have the capability in my office right now to bring up the details of the data. I can bring it up in an infinite number of comparisons or pieces of data. I can compare quarters and forecasts and actuals and history. We have taken that data and put it in a summary version for the executives; they get a fixed view

See **INTERVIEW** page 51

to build a prototype executive information application.

Northrup's X-Edit-based "electronic chart room" is actually an executive information application.

The system, currently being used by approximately 100 managers within the division's financial group, replaces the paper charts used previously and, in addition to eliminating paper, frees the conference space formerly reserved for hanging all the charts. Because of its success with X-Edit, Northrup is investigating expanding its executive support tools.

EIS does not typically spring full-grown from the existing union of MIS and management staff. The investment involved in planning and implementing a fully functional EIS is just too great.

Costs for a long-term, total information systems strategic planning EIS, rather than a single application initiative, can be high. Justifying these costs can be difficult because it is hard to quantify accurately the executive time involved in getting a successful system up and running.

The unique, business-specific, custom-tailored nature of an EIS is another key factor in the cost equation. According to one user estimate, costs for an EIS can range as high as 25% of the information systems budget. That includes the corporate conceptual data model and the resource support group for DSS-EIS projects.

Before DP or top management balks at this estimate, remember that EIS users are only one of the groups that benefit from a broad-scale EIS project. Everyone in the company benefits from the effort to improve MIS productivity and responsiveness.

Clearly, a project of such a grand scale cannot succeed if it is conceived without broad-based support, driven by senior-level executive endorsement.

According to EIS pioneers John Rockart and David DeLong of MIT's Center for Information Systems Research, a "committed and informed executive sponsor" is one of the EIS project's critical success factors.

These executive sponsors have to be willing to work with the operations people who actually build or customize the EIS so that it fits their personal needs.

According to Neese, during the EIS development at Browning Ferris, the largest block of time was spent going out and "discovering how individual managers went about managing and determining the unique requirements and perspectives of each executive."

Now that the company's executives can navigate the system, Neese says, they increasingly expect MIS to anticipate their information needs.

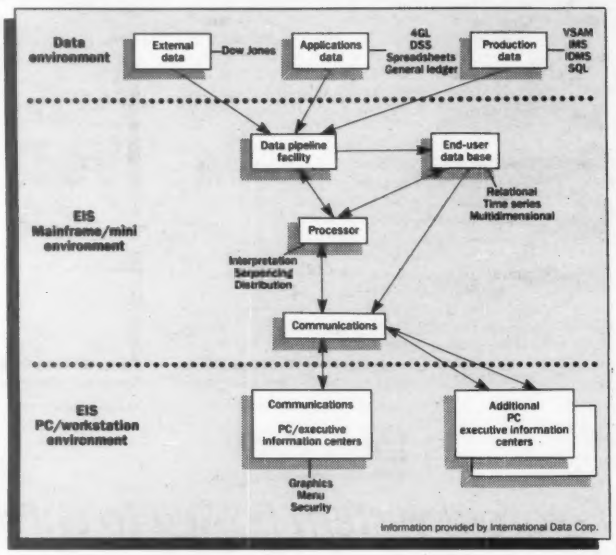
Certainly, expectations on both sides have to be kept in line with the limitations of technology and data access within the overall information systems environment.

Rockart and DeLong's guidelines strongly suggest that the high-level sponsors must have a realistic understanding of the implementation process. "A CEO initiating EIS activities is an indicator of success, but caution is warranted when the information systems department initiates the activity," Rockart says.

Both sides have to educate each other to understand and appreciate the human, financial and technical resources needed to feed and maintain the EIS. They must designate an operational sponsor to work closely with them throughout all stages of

Continued on page 50

TYPICAL EIS CONFIGURATION



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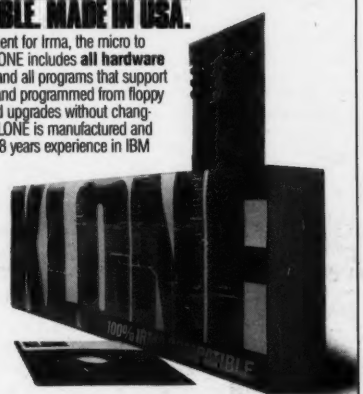
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Future of EIS: Natural language interfaces, expert systems

By C. LAWRENCE MEADOR

Artificial intelligence will play a role in executive information system (EIS) data retrieval, problem exploration, explanation, expert consultation, communications support, teaching, testing and automatic programming of applications.

The two branches of AI that will have the most impact on EIS are natural language interfaces and expert systems. Natural language interfaces allow humans and machines to converse without constraints of the stylized jargon found even in the highest level end-user programming languages. They provide executives with easier access to their information support data bases, which are the foundation of EIS more than 90% of the time. The more transparent the interface, the easier it will be to perform analysis and retrieval functions.

But a caveat is still in order. Yale University's Roger Schank, also president of Cognitive Systems, Inc., a provider of natural language interfaces, cautions that natural language systems must be supplied with the user's context and concepts as well as data in order to be useful. This may turn out to be especially true for EIS applications because of their highly user-oriented and often user-designed characteristics.

Two and half years ago, Paul LoRusso, vice-president of information systems at the Albert Einstein Medical Center in Philadelphia, went with Artificial Intelligence Corp.'s Intellect natural language interface product when he realized that "users didn't really want fancy reports, just answers to their questions."

Providing DP services to four hospitals as well as to several ancillary businesses, LoRusso's staff was receiving requests for five to seven data reports a week. "Users would embellish their requests to get our attention, because they thought we would respond more seriously to a respectably sized project than to a minor question," he says.

After purchasing Intellect, LoRusso and his staff set to work developing EIS applications for it. "We had learned from painful experience the kinds of data the users wanted, so we were able to develop a prototype lexicon that was nearly right on target," he says. He asked several key executives and their staffs to form a pilot group and to then use the prototype for two weeks.

From there, it was a matter of enhancing the lexicon — making the user interface more robust and more user-friendly. LoRusso's department now develops one new Intellect application every three months.

Currently, more than 150 people at Albert Einstein — from high-level executives to physicians and researchers — are using the tool in various applications. Most end users access it through IBM 3278 and 3279 CRTs already in place. The system runs on an IBM 3081 mainframe.

"Our executives now have a window into data that was previously not directly accessible to them," LoRusso explains. "Intellect provides them with a rapid ad hoc facility for requests, and it required no additional training."

He notes that the CEO logs on just about every morning and checks trends, statuses, lengths of stay and patient demographics, all with simple English language commands. "Since we've gone with Intellect I'd say we've received no more than three ad hoc report requests — total," LoRusso adds.

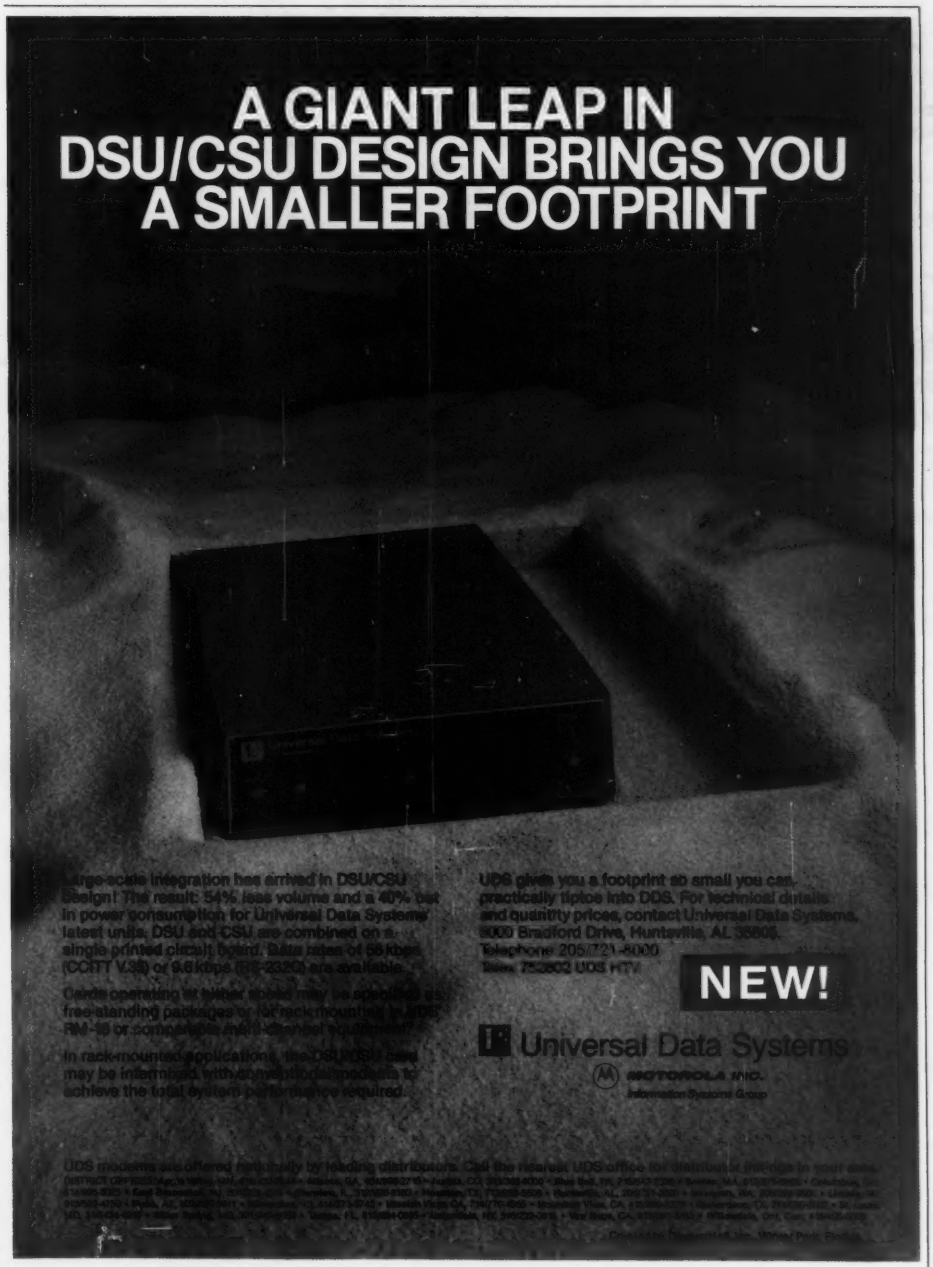
Other organizations are also delving into the natural language interface business, with an eye to supporting the development of EIS. These companies include Cognitive Systems, Comshare, Inc., Cullinet Software, Inc., Information Resources, Inc., Frey Associates, Inc. and Symantec Corp.

Expert systems, or expert support systems, make the experience of experts available to those with less expertise. In EIS, these programs will probably be directed to the decision-support mode — a program will assist the executive in addressing a problem but will not make the decision or solve the problem.

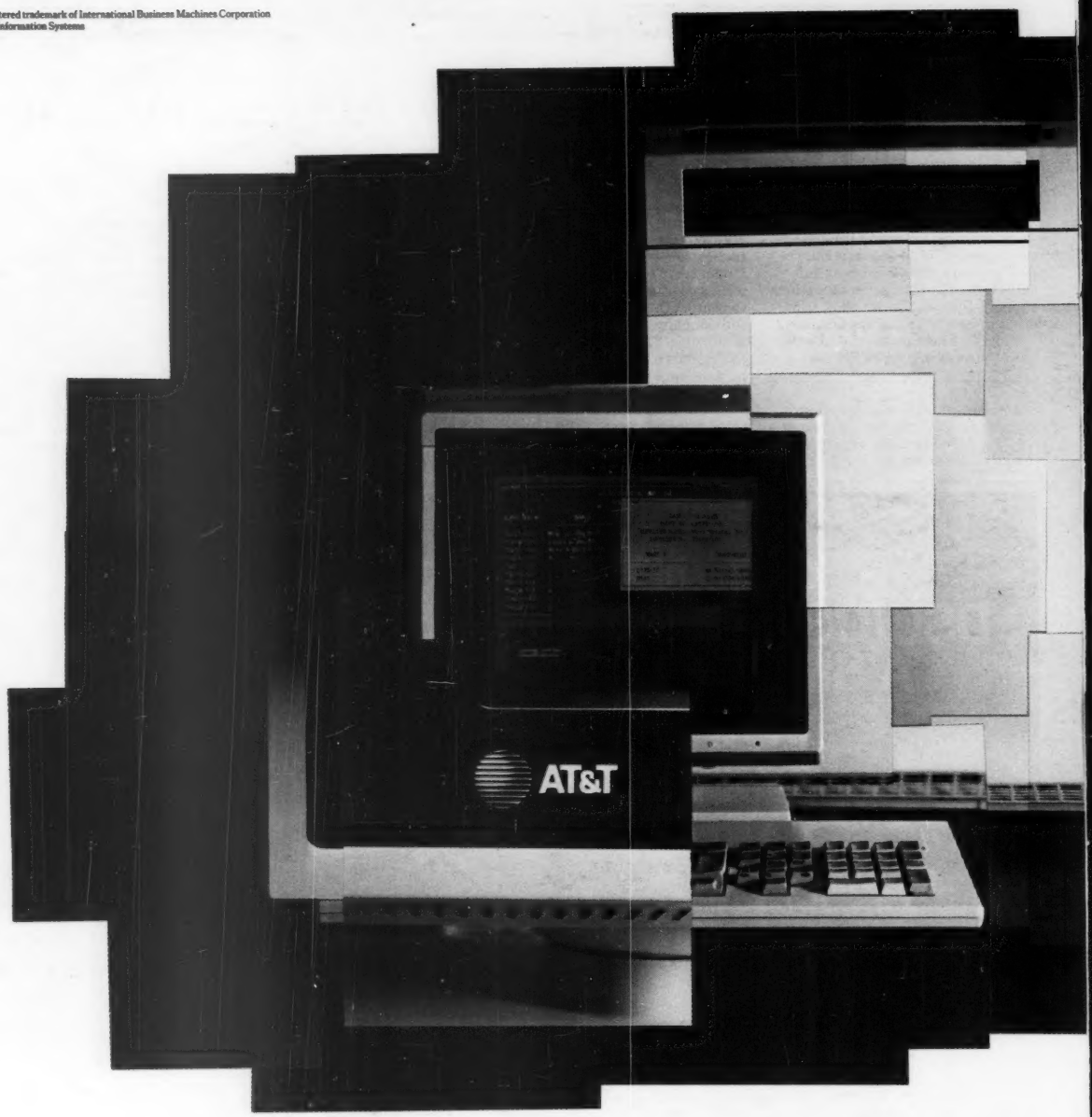
Serious funding is going into product development for the expert systems market, and EIS are one logical target application. All major computer hardware vendors have commitments to AI development as do many other top industrial firms — like General Motors Corp. and TRW, Inc.

One expert systems application that actually serves a support function is Xcon from Digital Equipment Corp. Xcon is used by the marketing, product distribution and delivery managers who form the DEC user community. They combine managerial judgment with Xcon recommendations before making final decisions on a customer installation. ■

Meador, president of Decision Support Technology, Inc., a consulting firm based in Cambridge, Mass., is also on the academic staff at MIT.



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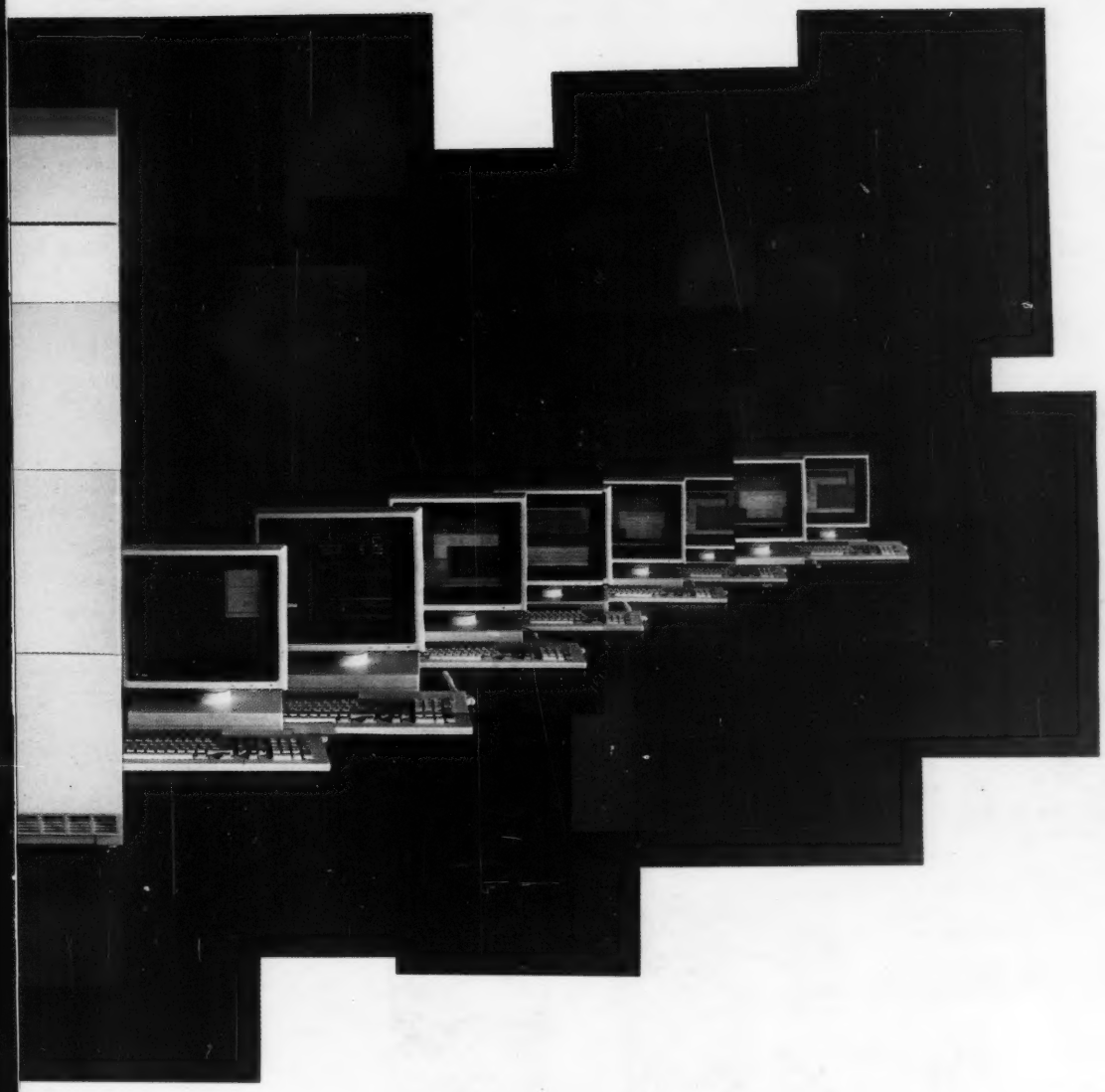
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Continued from page 46

the project. Finally, they should anticipate organizational impact and political resistance to establishment of the EIS.

MIS, therefore, must be able to deal not only with the technology, but also with the high-powered users, the politics and the visibility that it will ultimately achieve.

The constituencies that may resist an EIS include potential users, executive staff groups, secretaries, line management and suppliers of data going into the system. These groups may resist an EIS for their own reasons, and, while one group's vote may not be enough to derail the process, collectively they represent a significant challenge to the EIS development strategy. Loss of influence and power rank at the top of the list of perceived threats, along with the increased exposure to high-level review that the EIS promises.

But this resistance to change can be averted by getting a representative from each group involved in the design process.

John Kogan, a partner at Arthur Andersen & Co., suggests that building a coalition of corporate executives, day-to-day users of information and information systems managers, is vital to the long-term success of the project. Forming an executive steering committee to monitor the progress of the various contributing groups ensures that there is no question about high-level commitment to the project.

In addition to the management problems that EIS developers encounter, there are some technical concerns as well. Nine characteristics of EIS technology that any developer should consider include the following:

- A mainframe-based data base management system. Data has to be maintained on the mainframe and distributed on an as-needed basis to the PC on the executive's desk.
- Dynamic menus. Individual display elements — text, numbers or points on a graph — should provide access to the detailed information behind them.
- Use of standard hardware. This strategy provides the least risky and most cost-effective solution for most companies.
- Sophisticated displays. Delivery of the right information in the right form highlights the implications of the data being presented.
- Links to external data bases. Corporations and individuals do not operate in isolation from one another, so the EIS should interface with external sources of relevant information.
- Pointing devices. Mouses and touch-screen alternatives are critical for executives who do not type.
- An exception reporting capability. An integral part of any EIS system has to be the ability to highlight variations from expected, planned levels of performance.
- Sophisticated development systems. As user requirements evolve, the ability to rebuild and modify the EIS to respond to those changes will determine the ultimate benefits of the system.
- Text and time-series information handling capabilities. Text can provide the background information necessary to interpret data presented graphically.

Because virtually every company sets goals in relation to some time period, the systems have to be able to understand differences between daily, weekly, monthly, quarterly and annual data and also recognize the different types of data. The distinction between calendar and fiscal years should also be clear.

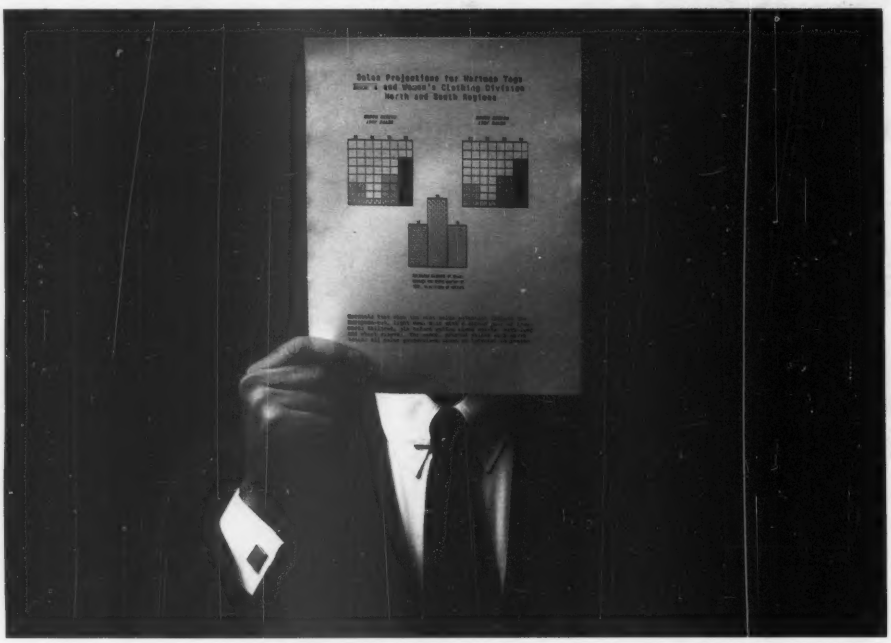
> ***MIS, therefore, must be able to deal not only with the technology, but also with the high-powered users, the politics and the visibility that it will ultimately achieve.***

Financial modeling and planning capability can also work within the framework of the EIS. These DSS components can provide a transition for the user between the EIS and the underlying information model. This permits the user to obtain alternative perspectives on the EIS applications' standard reports or charts.

An executive may, for example, after taking a look at the product-line view of a forecast, decide to take an organizational look at the same problem. The modeling foundation for the EIS gives the user added flexibility to easily address changing reporting and analysis requirements.

Clearly there is a fair amount of crossover between decision support systems and executive information system products. Although each share some of the features of the other, the differences lie in that EIS lean more toward monitoring and tracking, while DSS tend to stress analysis and reporting support. EIS are action- and integration-oriented.

In any event, the two EIS platform products are not likely to be sharing the limelight for much longer. The distinction between EIS and DSS is blurred, and the repositioning of other major DSS products — like Thorn EMI's FCS and Execucom's IFPS as well as products like Information Builders, Inc.'s Focus, Martin Marietta Data System's Ramis II and D&B Computing Services' Nomad2 packages — to target EIS applications is likely. ■

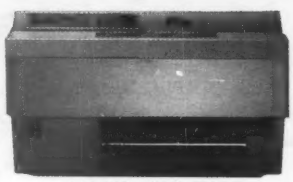


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INTERVIEW from page 45

set, but at the same time they have the capability of looking forward and backward. It's not ad hoc from the standpoint of creating their own reports, but it is ad hoc in that if they want to know what happened in the last quarter, they can get it. If they want to see what happened five years ago, they can get it.

Will your executives be able to make ad hoc queries at some point?

BROWN: I have ad hoc capability. But what we're finding out is that the capability that we have built into the system is infinite, so we're questioning how much ad hoc we need.

BALDWIN: We made the conscious decision not to give the top management of this company access to the total level of detail that we have, because we felt that we would discourage their use of the system — as it is not something that a casual user would use. One of the reasons that we in finance think we have to have a big role in this project is because we feel we're the best ones to decide what it is that we want to show to management of a financial nature. So we could have done a lot more, but our major goal was that it had to be quick. It had to be very user-friendly; it had to be simple. We did not want to discourage use.

Can you gather your information significantly faster now that you have this system up and running?

BROWN: I would say that when Bob [Baldwin] and I started working on this, 80% of my job was trying to get the data. I would say that is less than 20% of our effort today. So the rest of the time allows us to analyze it and present it.

Do you have any recommendations for our MIS readers concerning EIS?

BALDWIN: The most important point is to clearly define what it is you want to do. The second point is that it's a task that really is a lot larger than you think, and your expectations ought to be reasonable. It isn't going to happen overnight, and you really should have somebody working on it full time.

When we started this project, we had a person whose job, full time, was to help us define it and implement it. Even today I have a man on my staff who works on the technical solutions to the problems. It's a job which requires some free thinking.

Another recommendation is to set reasonable expectations about what you can deliver. My feeling is that there's no one combination of things today that will do everything that you want to do. So you need to bring together a variety of things, and there are compromises that you have to make.

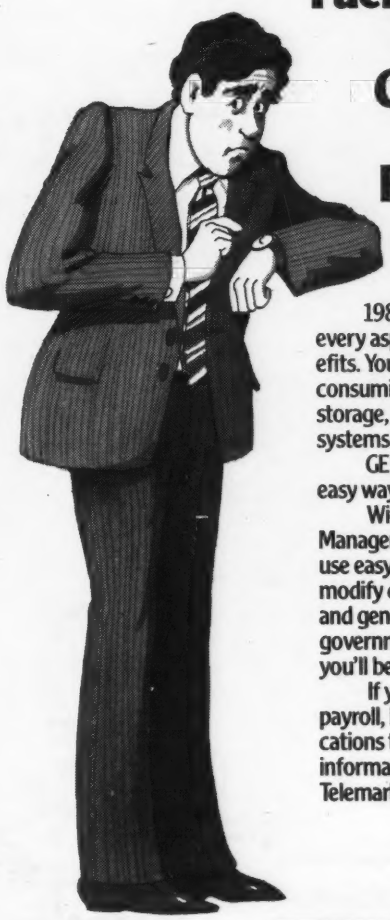
The last thing I would say is that it's a very fast-moving field in terms of what you can do, and what you have today that you may think is acceptable may be out in six to 12 months. So what you really have to be focusing in on is a concept of what you are trying to put in the president's office. You will probably stay true to that concept, but how you deliver it is something that is going to evolve and change over time. ■

Golden rules: EIS installation

In the process of researching the use of executive information systems (EIS), *Computerworld* interviewed managers at more than a dozen sites, as well as consultants who have been involved in EIS implementations. Below is a checklist of dos and don'ts based on that collected wisdom:

- ✔ Do lock in support from a politically secure senior executive early in the planning process.
- ✔ Do involve senior executives in the specification phases.
- ✔ Don't forget to focus on the individual user's critical success factors.
- ✔ Do manage the expectations of those who will ultimately be served by the system.
- ✔ Do solicit the cooperation of the keepers and providers of data throughout the organization.
- ✔ Do report on the project's status regularly and widely in order to build support.
- ✔ Don't shoot for the moon in the first phase; prototype if possible.
- ✔ Don't deluge the user with data, despite an apparently voracious appetite.
- ✔ Don't overwhelm the user with technology; it is better to err on the simple side.
- ✔ Don't rewrite applications unnecessarily; use gateway, link and communications technologies to work with existing applications.
- ✔ Don't ignore the response time issue.
- ✔ Don't hide the executive workstation in a remote location; executives won't use it if they don't see it.
- ✔ Do build in as much flexibility as possible into the underlying architecture.
- ✔ Do anticipate questions on security and be prepared with an approach that points out the benefits of the EIS.
- ✔ Do prepare for the clamor for additional ports and access from throughout the organization once the system is implemented.
- ✔ Do take credit for a successful implementation of one of the most visible and important applications in the company and your career.

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In Depth

New federal law bolsters computer security efforts

Computer crime laws deter unauthorized access • Should you report a computer crime? • Largest number of convictions — fraud by employees

By J. J. BUCK BLOOMBECKER

With the passage this month of a strengthened federal law, the Computer Fraud and Abuse Act of 1986 [CW Oct. 13] and new computer crime prohibitions in New York and Indiana, computer professionals can now use legal weapons against computer crime as never before. The federal government and most states now explicitly prohibit a range of computer crimes, which represents an unprecedented opportunity for the computer security professional to use the law as an adjunct of security policy.

So far, however, it seems that corporate and government victims of computer crime have shown little interest in going to court.

A computer crime census by the National Center for Computer Crime Data, a research institution in Los Angeles, was able to locate only 75 prosecutions pursuant to 38 states' computer crime laws. At a rate of fewer than two per state, the prosecution activity thus far is hardly frightening to a would-be embezzler. Though not as extreme as the Federal Bureau of Investigation's estimate that only one of 20,000 computer criminals goes to jail, the result of the census is nearly sufficient to encourage crimes. As long as criminals believe that the odds against punishment are great, their motivation will be accordingly great.

Using the criminal justice system to protect all of us is, to some extent, an obligation of citizenship as well as a time-tested social insurance strategy. Thus, one cannot discuss computer crime law without raising the major question every computer user must eventually face: Should we report a computer crime?

The importance of this question is underlined by the fact that short-term, narrow self-interest may well dictate a strategy opposite to that of long-term social responsibility. A number of victims of computer crime have confided, for example, that they did not report and prosecute computer crime cases because of embarrassment.

Another explanation is that it seldom seems cost-effective to be involved in a computer crime prosecution. The time involved in assisting prosecutors and investigators, the amount of unfavorable publicity a trial may involve and the relatively low probability that the defendant will make full restitution — all of these factors make it easy for a computer crime victim to conclude that the costs of prosecution outweigh the benefits.

But from another perspective, there must be a investment of faith in the criminal justice system as a preventer and detector of computer crime, or else the system will have no deterrent effect at all.

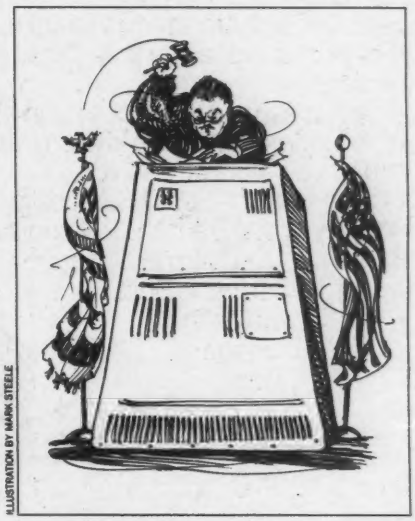


ILLUSTRATION BY MARK STEELE

Knowing exactly what the law prohibits should facilitate more informed — and ideally more responsible — reactions in the increasingly likely event that your computer system becomes the scene of a computer crime. What follows is a summary of the provisions of the federal and state computer crime laws, based on the ongoing research of the National Center for Computer Crime Data.

'Democratization' defined

Computer crime is becoming increasingly likely because computer technology is becoming more accessible. It is, unfortunately, becoming "abuser friendly." We call this trend the democratization of computer crime.

Democratization is the spread of computing to a far larger segment of the population in the last several years. With it has come a consequent increase in opportunities for anyone who wants to become some sort of computer criminal. Further — and unfortunately without any element of choice — virtually anyone can now become a computer crime victim.

The technology of computer crime has been democratized to the point where a modem, the most commonly used tool for hacking, can easily be bought for less than $500. And many computer criminals have received on-the-job training. Employees represent a far more significant computer crime threat than do juveniles or traditional criminals. The number of potential employee criminals grows as more jobs

About the author

BloomBecker is director of the National Center for Computer Crime Data, a nonprofit research institute in Los Angeles. An extended version of this article will appear in the November supplement to Datapro Reports on Information Security.

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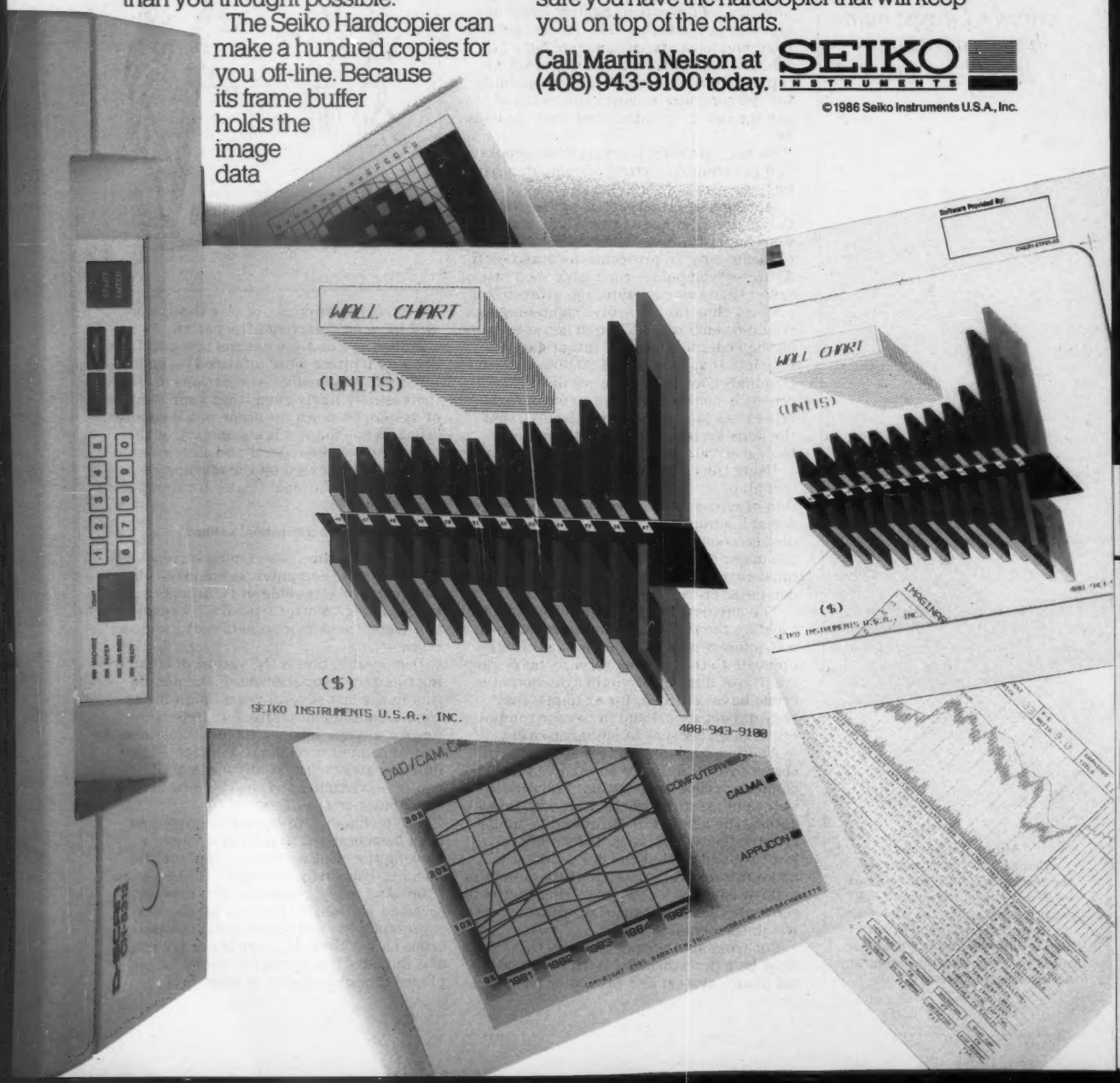
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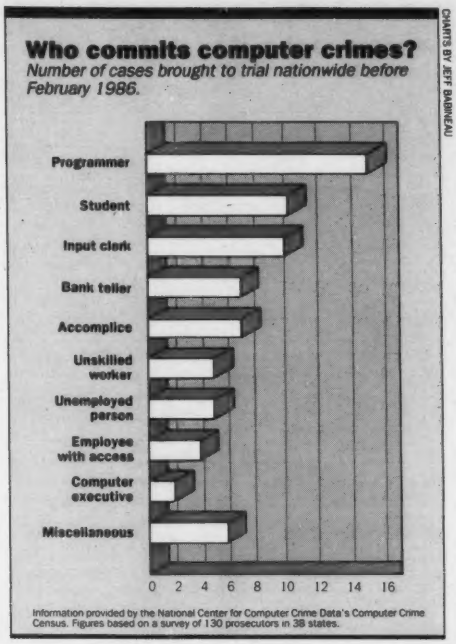
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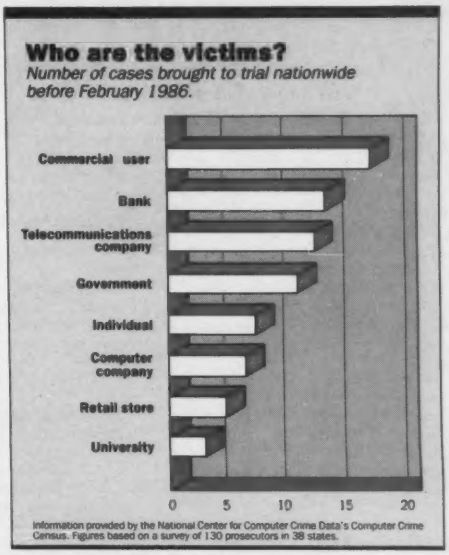
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CHARTS BY JEFF BABINEAU



involve computer use.

The largest category of defendants in the National Center for Computer Crime Data survey was employees. Included here are programmers, bank tellers, input clerks and other employees with access to their companies' systems.

Employees represent a continual threat, since they have far greater ability to do damage and far more system-specific information to base their efforts upon.

In addition, they often have more of a financial motive to commit a crime and often more psychological motivation to hurt the chosen victim.

Cases of malicious damage to computer systems are primarily cases involving employees or former employees.

Within the general category of employees, consultants as a group also stand out as particularly noticeable in the computer crime cases the National Center for Computer Crime Data has studied.

The computer crime census did not break out information on consultants, so no exact figures are available. However, the raw data suggests that a number of the programmers counted were actually consultants or temporary employees hired to do a specific job.

In many cases these work relationships were poorly defined in the employment contract, or there was no written contract at all.

Without in any way implying that all consultants are to be feared — no more than it is implied that all employees or all youths are to be feared — it is important to note that in a number of cases, individuals from outside a company gained information in the course of consulting work and then used the information against the company through a computer crime.

One such case was the case of Stanley Mark Rifkin, who stole $10.2 million from the Security Pacific National Bank using his knowledge of its wire transfer system, which he gained while he was working for the bank.

In another case, a consultant who was hired to assist a company in gaining the necessary environmental and zoning permits to begin manufacturing computer disks threatened to sell the formula for the production of disks to a competitor unless his employer paid him a ransom. He was easily convicted when he made his offer to an FBI agent posing as an agent of his company.

Computer crime laws are our nation's reaction to the types of computer crimes that have been reported and that it is feared will occur in the

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> ***The goal of these laws is to define those acts that will be punished in hope that the threat of punishment will deter some individuals from committing the acts.***

future. The goal of these laws, I believe, is to define those acts that will be punished in hope that the threat of punishment will deter some individuals from committing the acts. The purpose of this section is to summarize the types of acts that the computer crime laws attempt to combat.

Money theft. Many computer crimes involve theft of money. These range from complex bank frauds like the Wells Fargo theft to simple, even trivial falsifications of records that allow money to be misappropriated. It is the "big-killing" case that legislative testimony focuses on primarily, since few manual system crimes involve sums as large as those in the Equity Funding case, in *U.S.* v. *Rifkin* or in *U.S.* v. *Smith, Lewis and Marshall.*

Service theft. Use of computer services for one's own benefit may be for commercial or noncommercial purposes. An example of the latter is the case of a programmer who kept private files on the New York City Board of Education computer. He was found not guilty because the state theft of services law was held not to apply to his actions.

In contrast, in Indiana, a county employee was convicted of theft under the state's new criminal code for using less than 10 dollars' worth of the memory of a county computer system.

A case involving a Long Island, N.Y., university computer system demonstrates the commercial use of computer services. In this case, the manager of the computer center and his assistant used the school's computer to service commercial accounts for their own enrichment. They received at least $53,000 in revenue from one of their clients.

Program and data theft. Data and programs are themselves valuable property and thus are the subject of theft from computer systems. Employees have been charged with computer crime or trade secret theft on several occasions involving disputes between employee and employer as to what the employee is entitled to take upon leaving the company. In a number of these cases, the ex-employee is now employed in, or the owner of, a competing business.

Data alteration. Some changes in data allow criminals to derive significant gains, tangible or intangible. A recent prosecution in Los Angeles resulted in a guilty plea by an employee of the University of Southern California who had been taking payments from students and changing their grades in return.

Other reported schemes involved changes in credit information and changes in department of motor vehicles records that facilitated the theft of the cars to which the records referred.

Program damage. Programmers familiar with a system can do considerable harm by erasing or replacing parts of major programs.

A recent case involved a plan to erase the operating systems of two computers maintained by a Los Angeles corporation that operated several restaurants and fast-food outlets.

In another case, a "logic bomb" was used to interfere with operations at the Department of Water and Power in Los Angeles. A logic bomb is a program that causes a computer system not to operate as it should.

Data destruction. Mostly as acts of mischief, contents of files have been destroyed. In San Francisco, United States Leasing International, Inc. found that several people replaced words in their files with curse words, friends' names and similar material.

Malicious access. One of the leading issues in reaction to hacking is the problem of what to do when a hacker gets access to a computer system, reads some files but neither steals nor damages anything. This situation is becoming increasingly common in the computer crime cases that are prosecuted.

In California, a court found that the typical computer crime statute language prohibiting "malicious" access to a computer system did apply to users gaining access to others' computer systems. In some of the charges against the defendant in this case, there was evidence of not just access but also of damage to the computer system.

Violation of privacy. A consistent fear relating to computers is that the computer will facilitate invasions of privacy. Some jurisdictions — particularly in Europe, where privacy protection is more advanced — use administrative law to protect privacy more frequently than they use criminal law.

With the growing awareness of the dangers that computer crime poses to average citizens, it can be anticipated that invasions of privacy will increasingly be punished through the use of computer crime law. Several examples of this sort of prosecution already exist.

What assets do the laws protect?

Criminal law can be seen as the way in which society defines which assets it will protect. Thus the definitions contained in the computer crime laws are important because they make clear the extent to which computer crime law will protect the items with which a data processing professional comes in contact.

The common law frequently limits the definition of property to tangible items. Where computers are involved, this limitation is significant. Much of the value in a computer system consists of intangibles — especially data and programs.

Some of the most difficult issues in computer crime litigation involve the fact that much of the computer's operation consists of changes in electrical charge on various media or reproduction of those charges.

These electrical charges are not traditionally considered tangible, and there is considerable question as

A summary of the 47 state computer crime laws

		Acts Forbidden										
		Access or use		Alter, damage or destroy				Alter, take or disclose			Disrupt or deny	
	Class of crime[1]	Generally	To obtain property	Hardware	Software	To obtain property	Computer items	Data	Access codes	Services	Services	Critical services	Other
Ala.	M,F	•	•	•	•	•		•			•		
Alaska	M,F	•						[2]		•			Deceive a machine
Ariz.	F	•	•	•	•	•							
Calif.	M,F	•	•	•	•								
Colo.	M,F	•	•	•	•								
Conn.	M,F	•		•				[2]		•	•		
Del.	M,F	•		•				[2]		•	•		
Fla.	M,F			•	•	•					•	•	
Ga.	F	•	•	•	•			[3]					
Hawaii	M,F	•	•	•	•			[4]					
Idaho	M,F	•	•	•	•								
Ill.	M,F	•	•		•								
Ind.	M,F	•			•								
Iowa	M,F	•	•	•	•								
Kan.	M,F	•	•	•	•								
Ky.	M,F	•	•										Conceal computer information
La.	M,F		•	•	•			•					
Maine	-									•			
Mass.	-							[2,4]					
Md.	M	•						[5]					
Mich.	M,F		•	•	•								Use to commit other crimes
Minn.	M,F		•	•	•								
Miss.	M,F		•	•	•				•				
Mo.	M,F	•	•	•	•	•		[3]				•	
Mont.	M,F	•	•		•								
N.C.	M,F		•					•					Extortion
N.D.	F	•	•	•	•								
Neb.	M,F	•	•	•	•			[3]			•		
Nev.	M,F		•	•	•							•	
N.H.	M,F	•		•				•		•	•		
N.J.	M,F		•	•	•			•					
N.M.	M,F		•	•	•								
N.Y.	M,F	•	[6]		•	[6]	[7]						Receiving copies of material
Ohio	F	•	•					•			•		
Okla.	M,F	•	•										
Ore.	M,F		•	•	•					•			
Pa.	M,F	•	•									•	
R.I.	F		•	•	•		•						
S.C.	F		•	•	•		•				•		
S.D.	M,F	•	•		•				•				
Tenn.	F		•	•	•								Conceal computer information
Texas	M,F	•		•	•				•				
Utah	M,F		•	•	•	•	•	•			•		
Va.	M,F				•		•	[2,8]		•	•		Forgery
Wash.	M,F	•			•								
Wis.	M,F	•		•	•		•		•				
Wyo.	M,F			•	•	•		[3]				•	

[1] Misdemeanor (M) or felony (F)
[2] Private data
[3] Trade secret
[4] Credit data
[5] Public records
[6] Computer material
[7] Copying computer material
[8] Financial data

Information provided by the National Center for Computer Crime Data, "Computer Crime Law Reporter."

Every state except Arkansas, Vermont and West Virginia has enacted computer crime laws. Though they unanimously classify violations as criminal, the different state laws vary widely in the acts they forbid and the penalties they mete out.

to whether computerized data falls within the traditional legal concepts of property.

Thus, if one could steal information without taking anything physical, it could be (and in some courts has been) deemed that there has been no "taking" that is sufficient to constitute theft. The definitions used in the computer crime laws appear to aim at reducing this problem.

For example, a group of private insurance investigators took doctors' files without authorization, copied the contents of the files and then returned them. The investigators were prosecuted for theft, and their case was dismissed.

The Colorado Supreme Court ruled that since the investigators had no intent to permanently deprive the owners of the files of anything and sought only the intangible information the files contained, the Colorado theft law did not authorize prosecution for theft. Analogously, many malicious mischief statutes prohibit only damage to "real or personal property."

It is not at all clear that electrical impulses on a computer medium are real or personal property or that a change in the impulse is damage to the medium itself.

For reasons such as this, there are provisions in virtually all computer crime laws that define property much more broadly, including intangible data, software as well as information.

What acts are prohibited?

The 47 state computer crime laws and the two federal computer crime laws that have been passed in the last decade are reactions to a number of perceived and actual difficulties in applying common law criminal prohibitions to the types of interferences with computer systems that have been discussed above.

The fears motivating the institution of these laws revolved around the possibility of criminal behavior involving the computer either as the target of a crime or as the vehicle through which a crime might be committed.

Most state laws, and the federal laws discussed below, can be divided into four categories: definitions of computer assets, definitions and prescriptions of criminal behavior, punishment provisions and ancillary provisions.

The following summary attempts to describe the behavior forbidden by the various laws (see chart p. 52), the types of computer assets that are protected by the laws and a number of the details that determine the application of these laws to specific fact situations.

Federal computer crime law

At the end of 1984, the first federal computer crime law was passed. This bill was a compromise version of H.R. 5616, criminalizing unauthorized access to classified national security information or information in certain financial records.

Additionally, certain unauthorized access to computers operated on behalf of the government was criminalized.

This month, the second federal computer crime law was passed. This bill, called the Computer Fraud and Abuse Act of 1986, or H.R. 4718 in its House version, is the result of further hearings into the problem of computer crime by the House Committee on the Judiciary and the Senate Judiciary Committee.

> ***The definitions contained in the computer crime laws are important because they make clear the extent to which computer crime law will protect the items with which a data processing professional comes in contact.***

Mindful of questions of separation of power, the first federal computer crime bill did not extend its coverage to computers operating in interstate commerce.

The 1986 bill protects these computers against access with intent to defraud, access resulting in more than $1,000 loss and access to certain medical computer systems. It also prohibits trafficking in computer access passwords, which affects interstate commerce.

The more extended coverage was originally dropped in order to reach a compromise with legislators who hesitated to expand federal jurisdiction before further study demonstrated the need for it.

But after the 1986 hearings, Congress apparently felt that this expansion of jurisdiction was appropriate. The current computer crime law defines action as criminal if an individual does the following:

- "Knowingly . . . obtains information that has been determined by the U.S. Government . . . to require protection against unauthorized disclosure for reasons of national defense or foreign relations . . . or any restricted data."
- "Intentionally . . . obtains information contained in a financial record of a financial institution . . . or contained in a file of a consumer reporting agency on a consumer, as such terms are defined in the Fair Credit Reporting Act."
- "Intentionally accesses a computer without authorization if such computer is exclusively for the use of the Government of the United

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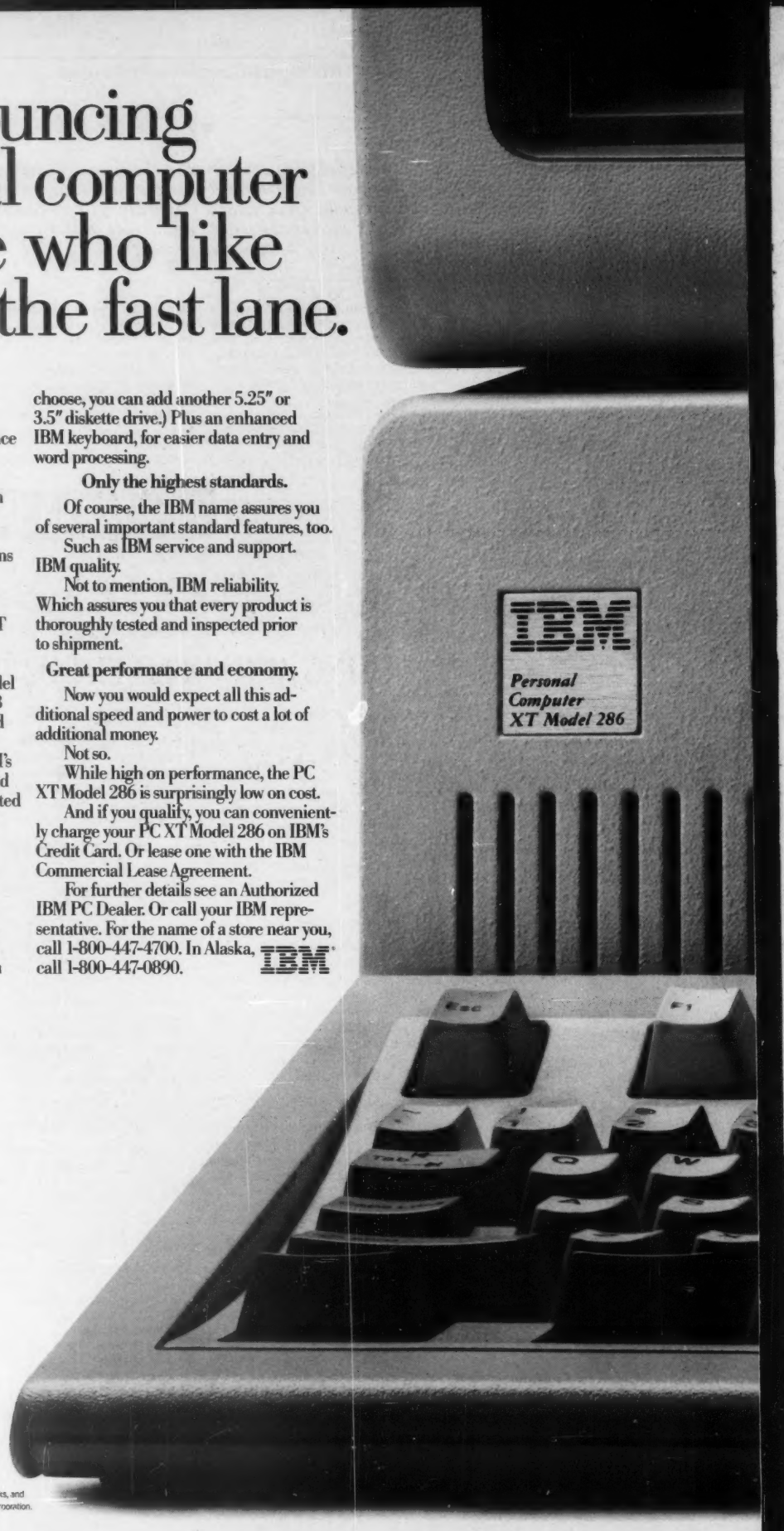
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States or, in the case of a computer not exclusively for such use, if such computer is used by or for the Government of the United States and such conduct affects such use."

• "Knowingly and with intent to defraud, accesses a Federal interest computer without authorization, or exceeds authorized access, and by means of such conduct furthers the intended fraud and obtains anything of value, unless the object of the fraud and the thing obtained consists only of the use of the computer."

• "Intentionally accesses a federal interest computer without authorization, and by means of one or more instances of such conduct alters information in that computer, or prevents authorized use of that computer, and thereby causes loss to one or more others of a value aggregating $1,000 or more during any one-year period, or modifies or impairs . . . the medical examination . . . diagnosis . . . treatment . . . or care of one or more individuals."

• "Knowingly and with intent to defraud trafficks . . . in any password or similar information through which a computer may be accessed without authorization if (a) such trafficking affects interstate or foreign commerce; or (b) such computer is used by or for the Government of the United States."

The 1986 computer crime law has eliminated an inconsistency between most state laws and the 1984 federal law. Like the state laws, the 1986 law explicitly criminalizes attempts and conspiracies to commit the crimes defined in the federal law.

Defining terms

Unlike the state laws based on either the Florida model or the Federal Computer Systems Protection Act (S. 1766), the new Section 1030 of Title 18 U. S. Code defines only six terms, three of them in ways relevant only to federal law.

It defines "computer" in a very extensive manner, including "electronic, magnetic, optical, electrochemical or other high-speed data processing device(s)." The definition of computer includes data storage or communications facilities directly related to, or acting in conjunction with, a computer.

A "federal interest computer," which is protected in Sections 4 and 5 of the bill, is defined as "one of two or more computers used in committing the offense, not all of which are located in the same state." In addition, Section 6 contains an even broader jurisdictional standard, where the criminal offense "affects interstate or foreign commerce."

Federal law defines "exceeds authorized access" as "to access a computer with authorization and to use such access to obtain or alter

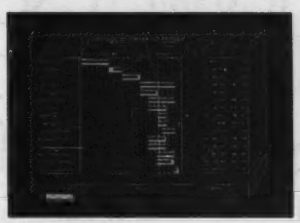
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> ***The widespread use of computers, especially by employees, has been responsible for a number of provisions that indicate that any authorized use of a computer cannot give rise to liability.***

information in the computer that the accessor is not entitled so to obtain or alter." The other terms defined are "state," "financial institution" and "financial record."

The federal law currently prohibits access to computer systems that is "knowing" (in paragraph 1), "intentional" (in paragraphs 2, 3 and 5) or "knowing and with intent to defraud" (in paragraphs 4 and 6) and without authorization or beyond authorization.

The House Judiciary Committee report on the 1986 Computer Fraud and Abuse Act explains that the shift from "knowing" to "intentional" access was designed to add "a slightly higher state-of-mind standard" to the law.

State laws

In interpreting the variety of state computer crime laws on the books, "intent" is often a key. The four important issues that concern the intent with which a computer crime is alleged to have been committed are knowledge, purpose, malice and authorization. As in most of the criminal law, computer crime law requires at the very least an awareness of what the person committing the crime is doing.

This knowledge is expressed by different words in different statutes. Included are the terms "knowing," "willful" and "intentional."

In the absence of judicial interpretations to the contrary, it appears appropriate to interpret all of these words to mean that the actor knows what he or she is doing.

Legally, this knowledge need not necessarily extend to the actual consequences of one's actions, as long as those consequences are reasonably foreseeable from the actions that were known.

For instance, members of the "414 gang" testified that they would try to get access to computer systems when they did not know the identity of the owners of those systems. Thus, they could argue that unless a certain computer system contained an introductory message alerting them that the system prohibited unauthorized access, they would have no way of knowing that such was the case.

In contrast to the former terms, the use of the word "purpose" in many computer crime laws would appear to require proof that someone charged under those laws had a specific intent to commit a certain type of crime.

Consider the language that says "Any person who . . . accesses . . . a computer . . . for the purpose of devising any scheme or artifice to defraud . . . is guilty of a computer crime." Knowingly getting access into a computer system without the intent to devise a scheme to defraud would not be a crime under this language.

If, for example, a hacker only wants to look around, not to change data, steal anything or otherwise disrupt the system, he or she would not be liable under such a provision.

Malice

Malice is generally interpreted as meaning a specific intent to do harm. Using the hacker example again, it would appear to be a defense to a statute forbidding "malicious" access to a computer system to prove that the accused did not intend to do harm.

For example, the defendant in *People* v. *Austin* contested this issue in a case recently concluded in Los Angeles. In response to the charge that he had maliciously accessed a number of computer systems, Austin argued that his accesses were not meant to harm any of the

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Invisible safecrackers: Today's thieves work through wires

Electronic banking spawns highly lucrative crime wave

By AUGUST BEQUAI

One weekend in 1965, a gang of safecrackers used a 70-mm. antitank gun to blast their way into a Brink's vault in Syracuse, N.Y. They made away with about $300,000.

Today's successful safecracker has gone electronic. As vaults give way to electronic funds transfer (EFT) systems, security experts are concerned that EFT thefts could run into the trillions of dollars. A bank security officer once remarked, "It's something that really scares us. It's frightening."

EFT makes police and banking officials nervous and with reason. More than $2 trillion moves daily through global EFT networks. Automated teller machines (ATM) alone handle more than three billion transactions involving $250 billion annually. But the Interbank Card Association, which represents the Mastercard system and other banking groups, fears that ATMs are vulnerable to theft.

The U.S. Department of Justice has already identified four areas in which EFT systems are vulnerable: unauthorized use of access devices, frauds by authorized users, internal manipulations by dishonest employees and sabotage. The federal government, the biggest user of EFT systems, is particularly concerned with the manipulation of these systems by dishonest insiders. As illustrated by the following examples, others share this concern:

- In Switzerland, a gang of electronic thieves intercepted an EFT transmission and diverted the funds to their own accounts.
- In Japan, a communications engineer with the Nippon Telephone & Telegraph Co. tapped a bank's EFT lines and gained access to the account numbers of its cash-card customers. Armed with these and counterfeit cards, he took the bank for more than 170 million yen before being discovered.
- In the U.S., a bank data entry clerk stole more than $25,000 in a two-month period simply by manipulating the automated central information files. This enabled him to access customer accounts through the bank's ATMs.

According to the American Bankers Association, more than 60% of the 225 banks that it surveyed had been the victim, at least once, of an EFT fraud. Many of the offenses had been committed by dishonest insiders.

A series of hearings on EFT systems by the U.S. House Banking Committee came up with a number of findings. First, "remote muggings" involving ATMs were becoming a problem. Thieves were finding it lucrative to rob people who had just withdrawn money from ATMs. Also, the theft of ATM cards and codes had become commonplace. Next, impersonating bank officials, thieves were telephoning banks and their customers to obtain secret codes. Lastly, dishonest customers were making withdrawals while claiming they had lost their ATM cards.

Although there is mounting evidence that EFT crimes are increasing, a consensus has not yet been reached on what exactly constitutes an EFT crime or on the scope of the problem. Suffice it to say that these crimes are unlawful acts directed at — or making use of — one or more EFT systems. Annual losses attributed to EFT crimes are said to range anywhere from 100 million to several billion dollars, depending on the source.

Computer crime has been in the limelight of criminology in recent years, and EFT thefts and frauds, one of its offshoots, has recently been scrutinized by such groups as the American Bankers Association and various law enforcement and congressional commitees. From these sources and from the crimes that have surfaced, we find that EFT offenses can take the following forms:

- Physical attacks directed at EFT systems or any of their components.
- Robberies, thefts and other attacks that are directed at users of these systems.
- Unauthorized use of access devices such as cards, plates, codes, account numbers, passwords or any other device used to gain access to an account.
- Fraud and thefts by authorized users in which, for example, the user falsely claims that a third party used his access device to make withdrawals from his account.
- Frauds and thefts by dishonest insiders: Armed with a customer's card and personal identification number, these thieves carry out unauthorized withdrawals and transfers.
- Thefts based on error — that is, situations in which a dishonest customer steals funds erroneously deposited in his account.
- Unauthorized transactions by outsiders, often carried out with the help of dishonest employees.
- Blackmail, especially in cases in which the account holder occupies a sensitive political position.
- Manipulation of data, often involving the internal manipulation of the system's software or hardware.
- Extortion, especially when terrorists and other political extremists are involved.
- Electronic interceptions, often directed at a system's communications lines.
- Counterfeiting of access devices, a carryover from the credit card industry.

In part, the lack of valid data in the area of EFT crime must be attributed to the financial industry. Fearful that if might scare away existing or potential EFT customers, the industry has often swept the problem under the rug. The financial community does, however, recognize the threat of EFT crime. Efforts are underway to educate EFT users on the need for security and to enact state laws that would facilitate the prosecution of EFT criminals. The U.S. Congress just passed a law making it a federal crime to misuse access devices.

New security devices are also hitting the market. For example, plans are afoot to improve access security through the use of fingerprint scanners. A scanner would compare the user's fingerprints with those stored in digital form in the bank's computer. Depending on whether the prints matched, it would either permit or deny access to the system. Chemical Bank, First Interstate and Wells Fargo Bank, N.A. are exploring their possible use.

There are also plans to replace present EFT cards with smart cards — "plastic money that talks." First test-marketed in Europe, the card contains a tiny memory and a microcomputer in a silicon chip that is the size of a small coin. The microchip contains both the customer's account number and credit limit; data can be encoded on it for up to 180 separate accounts.

The smart card is not without its drawbacks. It is costly to produce — more than $15, as compared with 65 cents for the type of cards currently used.

Also under consideration are such safeguards as voice identification, hand pattern identification and signature identification. All of these are costly and safeguard only entry into the system, not the total system. They must be viewed as merely the beginning in a long and drawn-out process to make EFT systems secure.

> ***One selling pitch of the cashless society is that it will serve to curtail crime. However, it has spawned new, more costly crimes.***

One of the selling pitches of the cashless society has been that it will serve to curtail crime. By that, its proponents must obviously mean traditional crime, since the cashless society has already spawned new and more costly crimes. Difficult to detect and guard against, these crimes pose a challenge to the viability of the financial sector — one that we have yet to address.

As is the case with computer crime, a lack of confidence in the ability of our criminal justice system to address these offenses only serves to reinforce the financial industry's reluctance to come forth and assist in identifying these offenses. Often when frauds surface, a financial institution's practice is to refer them to its in-house security staff for disposition. The wide variety of definitions and procedures used by banks to record these frauds makes it easy to mask the crimes.

We need to determine both the prevalence and characteristics of these crimes if we are to address the problem. Without these, the task of developing safeguards and laws to tackle the problem could prove difficult, if not futile.

Security is an important first step in securing EFT systems. But of even greater importance is the need to carefully scrutinize the cashless revolution. Its impact and implications for our society are too great to be left solely in the hands of the financial community. ■

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computer systems and thus were not malicious.

His argument, however, was unsuccessful, and after a court trial, he was incarcerated for a presentence probation examination and then placed on felony probation.

Nonmalicious access

In order to eliminate the requirement of malice, some statutes have been drafted explicitly to punish nonmalicious access. Subsequent to the filing of the Austin case, for example, California added a computer trespass section to its computer crime law. It prohibits entry into a computer system that is knowing and without authorization, but not malicious.

In another example, New Jersey law includes a provision defining as a "disorderly person" one who "purposely and without authorization accesses a computer . . . and this action does not result in altering, damage or destruction of any property or services."

A number of statutes indicate that only "unauthorized access" to computer systems can be punished. Some statutes explicitly define authorization. Colorado, for example, defines authorization as "the express consent of a person which may include an employee's job description to use said person's computer, computer network, computer program, computer software, computer system, property or services."

Defenses

A number of the computer crime laws include provisions that can be used as defenses by those accused of computer crime. The widespread use of computers, especially by employees, has been responsible for a number of provisions that indicate that any authorized use of a computer cannot give rise to liability. As shown above, many of the statutes do this directly in their definition of computer crime by prohibiting only unauthorized acts.

Connecticut law explicitly creates "authorization" as an affirmative defense, providing that: "It shall be an affirmative defense to a prosecution for unauthorized access to a

> ***The determination of the punishment in a specific case will depend on the type of crime, type of harm, existence of enhancement provisions, existence of multiplier provisions and civil remedies.***

computer system that a person reasonably believed that the owner of the computer system, or a person empowered to license access thereto, would have authorized him to access without payment of any consideration, or that person reasonably could not have known that his access was unauthorized."

Analogously, though not quite so clearly, California appears to create a defense for computer access done in the course of one's employment.

It provides that "any person who intentionally and without authorization accesses any computer system . . . with knowledge that the access was not authorized shall be guilty of a public offense. This subdivision shall not apply to any person who accesses his or her employer's computer system, computer network, computer program or data when acting within the scope of his or her employment."

The New York law allows as a defense the argument that the defendant had reasonable grounds to believe he or she was authorized to use a computer, to alter its data or to copy data or programs.

Texas law exempts employees of communications common carriers as well as electric utilities from liability, so long as their actions were in the course of employment and necessary to protect the property of their employer.

Kansas law makes it a defense if "the property or services were appropriated openly and avowedly under a claim of title made in good faith."

Punishment

The range of punishment for computer crime is immense. It ranges from infraction treatment in California requiring the payment of a small fine to prison sentences as long as 10 years and fines that can be as much as $100,000 in Oklahoma.

The determination of the punishment in a specific case will depend on the type of crime, type of harm, existence of enhancement provisions, existence of multiplier provisions and civil remedies.

The provisions of the 1986 law make significant changes in the structure of punishments for federal computer crimes.

Crimes involving access to classified information can be punished by a fine and/or 10 years' imprisonment.

The earlier bill's provision that the fine could be up to twice the value obtained by the offense has been dropped, and now the general provisions of the Criminal Fine Enforcement Act of 1984 govern the allowable fine.

Further, second offenses can be punished with 20 years of imprisonment and/or a fine.

Violations of Section 3 of the 1986 law dealing with unauthorized access or Section 6, dealing with trafficking in passwords, can be punished with imprisonment for one year or less and/or a fine.

The same offenses or violations of Section 2, dealing with financial records, can be punished with imprisonment for not more than 10 years if there has been a prior conviction for the same crime.

Violations of Section 4, dealing with computer access with intent to commit fraud, or Section 5, dealing with alteration of computer information or interference with computer use, can be punished with up to five years imprisonment and/or a fine.

A prior conviction under

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Sections 4 or 5 can increase the imprisonment to a term of 10 years.

Attempts are treated the same as completed crimes for purposes of punishment.

Valuation

One of the difficult issues in computer crimes is valuation. If the asset that has been damaged or taken can be freely traded — like a personal computer or even a custom-made computer program — then calculating the market value of the lost or damaged asset is usually adequate. Other cases are not so easily measured.

A variety of measures of value are found in the computer crime laws:

- Connecticut sets value at the market value or replacement cost at the time of violation.
- Iowa calls the value of property taken or destroyed "loss" and defines it as the retail value or replacement or repair cost, whichever is less.
- Montana has a definition similar to Connecticut's. It includes the following: "The value of electronic impulses, electronically produced data or information . . . or any other tangible or intangible item relating to a computer . . . shall be considered to be the amount of economic loss that the owner of the item might reasonably suffer by virtue of the loss of the item. The determination of the amount of such economic loss includes but is not limited to consideration of the value of the owner's right to exclusive use or disposition of the item."

Unresolved Issues

As indicated above, democratization has been the biggest change in the computer crime landscape in the last few years. The most significant consequence is the fact that hacking remains more of a problem than ever before.

The primary problem is the relative youth of the participants and the seriousness of the potential damage they can do.

Federal law is virtually useless where juveniles are concerned. Before a juvenile is tried in a U.S. federal court, the attorney general of the U.S., after investigation, must file a certificate asserting that the juvenile court or other appropriate state court does not have jurisdiction in the case or that it refuses to assume jurisdiction — or that the state juvenile system does not have available programs and services that are considered adequate for the needs of the juvenile.

As a practical matter, this has meant that virtually all juveniles who are arrested by the FBI have been released or have been referred to the local police for prosecution.

Few federal cases have been brought against these juveniles.

A related question is one of forming an appropriate corporate policy to deal with minors. There are significant differences of opinion about the ideal degree of freedom that young computer enthusiasts should be allowed in their interaction with mainframes.

A policy for minors

While all responsible commentators agree that doing serious damage by changing data or programs is wrong, other questions are more difficult:

- Should hackers be hired to investigate computer crime?
- Will better security simply lead to more efforts by hackers to break a computer system's security?
- What is the appropriate punishment for someone who is convicted of hacking?

The company contemplating taking action against a young computer user also will want to avoid the appearance of overreaction that seemed to accompany the raids by the FBI in August 1983, when its agents seized the computers of 15 teenagers.

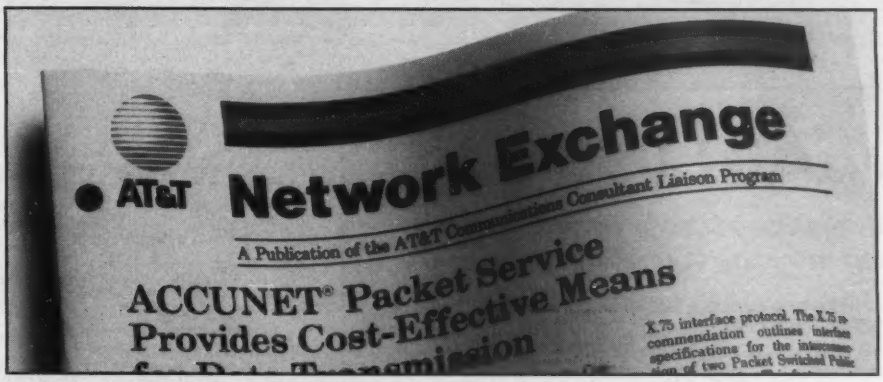
Another case represents the need for careful attention to the impressions that may result from poorly considered prosecution decisions, for example, the Tcimpidis case that was prosecuted in Los Angeles in 1984 and 1985.

In this case, a systems

CORRECTION

The correct name of the systems integrator mentioned in the story on the American Association of Retired Persons [In Depth, Oct. 6] is American Management Systems, Inc.

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operator was charged with a crime for "publishing" a telephone company credit card number.

There was no allegation that he had posted the number on the bulletin board system that he ran, but only that the act of operating his system made him a publisher of all the information contained on it.

The case drew considerable attention, since it suggested a broad range of criminal liabilities for operators of bulletin boards.

The comment of the telephone company representative — that next time he would pick someone who was really guilty — did little to reassure those in the public who considered the case as an attempt by the phone company to reduce the spread of bulletin boards.

In the future, computer professionals can expect to be increasingly challenged to define their responsibility for the security of computer systems.

Otherwise, they will find others defining the responsibility for them.

> ***In the future, computer professionals can expect to be increasingly challenged to define their responsibility for the security of computer systems.***

Take the initiative

A California case alleged that TRW, Inc. was in violation of the Fair Credit Reporting Act for failing to take adequate steps to protect the privacy of information in its computer data base. The case was settled before trial, precluding a legal interpretation of the metes and bounds of TRW's responsibility.

Citibank N.A. settled a civil action brought by the New York Attorney General's office, based in part on inadequate security for its automated teller machines.

The future of computer crime law is likely to see increasing emphasis on what the computer user can do to protect the data and computer services that make up the heart of the enterprise.

The forward-looking student of data security may well contemplate the fact that the "414 gang" case was used by a number of editorialists to demonstrate the relatively backward state of security awareness on the part of several of the gang's victims.

This attitude could easily translate into increased demands that businesses using computers develop greater security measures on their own or submit to governmental regulation to achieve the same end.

If for no other reason, users should improve their use of existing computer security tools, like computer crime laws, before demands rise for greater governmental involvement in the computer security area. ■

To investigate a crime, call —

As a result of increased activity and increased calls for greater computer security, the number of participants in computer security has grown, offering a number of new choices for a computer security professional trying to decide how to proceed in the investigation or prosecution of a computer crime. Depending on the jurisdiction and the case, any of the following might be helpful.

Local police. Los Angeles, New York, St. Louis and Chicago all have some form of computer fraud unit within their police departments. Many other cities employ individuals who have been trained in computer crime investigations by the Federal Bureau of Investigation, International Association of Chiefs of Police, local attorney generals' offices or private groups. In Silicon Valley, local police departments work together, sharing investigative and educational efforts.

District attorney. A number of areas have had active district attorneys prosecuting computer crime for several years.

In most states with computer crime laws, the district attorney is the prosecutor charged with prosecuting computer crime cases. In many jurisdictions, separate investigative staffs or personnel are attached to a specific unit of the district attorney's office. These investigators may be called on independently of the police investigators.

Which investigator to call is seldom clear. It will usually be determined by cooperation between the prosecutors and investigators who become aware of the case.

Attorney general's office. Though most states vest primary jurisdiction in computer crime prosecutions to district attorneys, attorney generals' offices throughout the country are increasingly becoming involved in computer crime investigations. In most states, the attorney general's office is empowered to investigate any crime and may prosecute the case itself or, more usually, will refer it to the local prosecutor for trial.

FBI. The first law enforcement group to train a large number of its members in computer crime law, the FBI has been active in computer crime investigation for a number of years. The 1984 federal computer crime law stipulates that the FBI and the Secret Service will investigate computer crime cases defined by that law. The law calls for the secretary of the U.S. Department of the Treasury and the U.S. attorney general to draft an agreement spelling out the two organizations' jurisdiction in the area of computer crime.

Secret Service. The Secret Service maintains a traditional role in the investigation of crimes involving counterfeit currency. With the new federal computer crime law, that role will be expanded to include all the computer crimes described in the new law.

U.S. Attorney. The U.S. Attorney's office has prosecuted a number of the major computer fraud cases in history, without relying on computer crime laws. The role of the U.S. Attorney is solely prosecutorial, as the FBI does much of the investigative work.

Professional organizations. Those seeking assistance in the investigation of a computer crime or the application of computer crime laws to a specific situation have a number of nongovernmental sources to call upon for help, including the following:

- The American Society for Industrial Security is the leading professional security organization. Its active National Computer Security Committee consists of a number of experienced computer security professionals.
- The Association for Computing Machinery includes a special interest group on security, audit and control. The group occasionally publishes a newsletter.
- The Computer Security Institute is a private, for-profit organization that organizes a number of computer security-related seminars and publishes a newsletter, a journal and a computer security reference book.
- The Information System Security Association is a nonprofit national group of computer security professionals with local chapters in many cities. They have regular meetings and an annual seminar.
- The National Center for Computer Crime Data is a nonprofit research institute that investigates computer crime, computer security and computer ethics. It publishes a book, the *Computer Crime Law Reporter;* a newsletter, "Conscience in Computing;" and an annual statistical report, "Computer Crime, Computer Security, Computer Ethics."
- MIS Training Institute is a seminar company that offers a number of seminars on computer crime, computer security and all aspects of DP auditing.
- The EDP Auditors Association is a nonprofit organization that publishes a newsletter, sponsors seminars and certifies members as Certified Information Security Analysts if they pass a certification examination.

Computer security vendors. Numerous companies are involved in selling computer security products. It is important to point out that these vendors can often offer invaluable assistance in processing a computer crime case, particularly when the case involves an understanding of the operation of the vendors' products.

Victims. Particularly in the case of the telecommunications carriers, victims of computer crime may provide important assistance to other victims or to potential victims. GTE Telenet Communications Corp., for example, has provided significant assistance in a case that resulted in one of the first filings pursuant to the new federal computer crime law. ■

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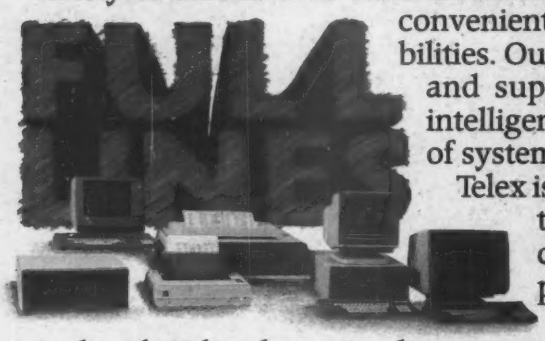


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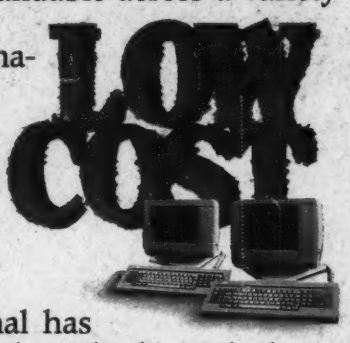
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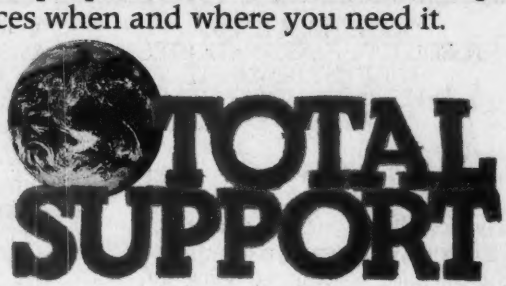


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MANAGEMENT

TAKING CHARGE
Alan E. Brill

Grilling your consultants

At some time or another, your company or agency will probably consider using data processing consultants. Whenever the use of consultants is proposed, it's valid to question whether the work should be contracted out or done in-house. But for the moment let's assume the Powers That Be have decreed that consultants will be used.

Just who is it that is going to do this presumably vital work for you? All too often, you don't know. Oh, you may know that the consulting firm to be used is the finest, with 75 years of flawless service and 63,000 absolutely satisfied clients. That's all well and good. But companies forget that consulting firms don't do consulting. Consultants do. Individuals who program, analyze and design also live, breathe and make mistakes. So why should you trust an important, expensive project to them?

Frequently this question isn't asked or, if asked, isn't pursued. You have to determine the specific experience of the particular consulting staff members who are going to be assigned to your work. So, I'd like to suggest a series of questions that you insist be fully answered by the consulting firms you are considering:

• What is the specific experience of each person who will work on your project? Insist on specifics, not "seven years of varied and responsible experience." You need verifiable references.

See **GRILLING** page 74

Brill is director of computer security services for the New York City Department of Investigation.

Investors scan data base

Satellite service culls info from 10 brokerages

By David A. Ludlum

When E.F. Hutton & Co. talks, people listen. But some people, particularly investment professionals, also listen to a dozen or more other brokerage houses, resulting in a barely manageable information overload.

To address the problem, some of the most influential of these professionals are subscribing to a data base of nearly real-time investment information from 10 leading brokerage firms that is delivered by satellite and can be searched according to individual specifications.

In an unusual spirit of cooperation among rivals, the service is partly owned by six of Wall Street's most prestigious investment houses. In the best of the Street's clubby tradition, a committee of the firms' representatives rules on which other firms can contribute data to the service and which may receive it.

The service, First Call, provided by First Call Corp. of Boston, delivers notes from securities analysts' morning meetings at the 10 brokerage houses to institutional investment managers and professional stock speculators.

The subscribers receive the data via satellite on Televideo Systems, Inc.'s Telecat 286 personal computers, which pluck out the latest reports on specified companies, industries or individual portfolios that a user manages.

Information managers at companies using the service say it goes beyond others in commingling information from a number of brokerages and providing sophisticated search features. Previously, many of the users relied on similar services offered by

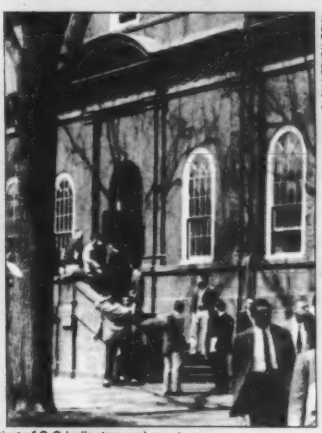
See **INVESTORS** page 78

DATA VIEW

DP managers rate courses

Communications, Cobol get high marks

Course	Weighted Score*
Introduction to Data Processing	3.80
Systems Analysis	3.47
Data Communications	3.44
Cobol Programming 1	3.42
Cobol Programming 2	3.24
Data Base Systems	3.24
Accounting 1	3.07
Computer Operations	2.89
Accounting 2	2.76
Basic Programming 1	2.36
Basic Programming 2	2.18
RPG II Programming	1.62
Fortran Programming	1.33
Pascal Programming	1.16



WIDE WORLD PHOTO

* A rating of 4.0 indicates maximum importance; a rating of 0.0 indicates no importance.

Information provided by Robert W. Bliss, professor of business science at Saddleback College in Mission Viejo, Calif., from a survey of 45 of the 100 largest employers in Orange County, Calif.

INSIDE

Managers on the move/**70**

Calendar: Selected conferences, exhibitions, seminars/**70**

INSTANT ANALYSIS

"The chief information officer could become less important as technology is put in place."

— Max Hopper, senior vice-president, information systems, American Airlines

MANAGEMENT MEMO

GE searches for software engineers; DP employment remains steady

Software engineering gains impetus as a General Electric Co. training program offers computer science or engineering majors more than $28,000 a year as well as help in earning their master's degrees.

Software engineering stresses the application of engineering, management and communication skills to the development and maintenance of software, according to David E. Priest, GE's manager of software engineering services.

"It's more than sitting down and developing code," Priest said. The concept stresses a structured approach to programming and spending time up front defining the requirements, which calls for business knowledge, he said.

It also emphasizes teamwork, as more complex software requires more workers, and GE seeks candidates good at interacting with others, Priest said. "We're looking for people who can be leaders, and that takes communication."

Participants in GE's three-year training program — 12 to 15 trainees each year — work at its corporate research and development center, located in Schenectady, N.Y., and generally study at nearby Rensselaer Polytechnic Institute.

After finishing the training program, participants work in various parts of the highly diversified company. Among the few schools with graduate-level software engineering programs are the Wang Institute in Lowell, Mass., and Seattle University.

Last year, the U.S. Defense Department awarded Carnegie-Mellon University a $103 million, five-year contract to manage its new Software Engineering Institute.

■

There will be no perceptible growth in data processing employment this quarter among companies responding to a recent survey, which also found 91% of respondents do not consider turnover a problem.

About 65% of the departments responding to the Data Processing Management Association (DPMA) survey said employment will not change in the fourth quarter, while 29% said they would hire, and 6% said they would reduce employment.

On the average, the companies hiring workers will take on 3.9 employees for new positions and 1.6 employees as replacements, the DPMA reported.

The most sought-after workers are programmers, at 44% of expected hires; systems analysts at 22%; data entry operators at 13%; and data base specialists at 12%.

Turnover has not shown up as a problem in three years of surveys, DPMA spokesman William Zalud said. "The executive search firms like to talk about it, but our figures don't indicate it's a problem," Zalud added.

MANAGERS ON THE MOVE

Gold Kist, Inc., the Atlanta-based farm cooperative, has announced changes in its information services office in conjunction with the merger of the office's data center operations and administrative services and the expansion of end-user computing to include technology planning.

Ladale Lankford, administrative services and planning manager, has been named director of operations and administrative services.

Bill Pierce, who was formerly manager of end-user computing, has been named director of technology planning and user computing.

Charles T. Kenyon, 45, has been named senior vice-president of internal operations at **Blue Cross and Blue Shield of New Hampshire**, based in Concord, N.H. Kenyon is responsible for benefits administration, computer services, systems and programming and information systems support services. He had served as vice-president of Group Life and Health Customer Services at Boston's New England Mutual Life Co.



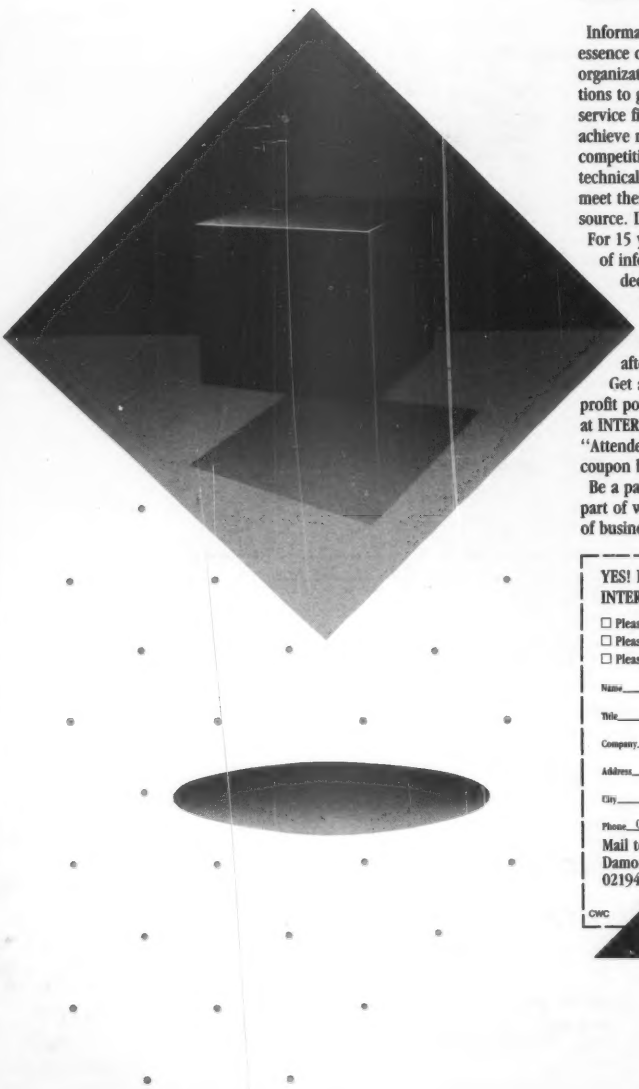
Charles T. Kenyon

■

Phillips Petroleum Co. of Bartlesville, Okla., has announced reassignments in information services.

Ken Adams, formerly software development supervisor, has been named director of systems services. **John Swanson**, manager of distributed data processing, has been named manager of the commercial systems development division.

Ray Stas, formerly director of desktop computers for the information services staff, has been appointed manager of the technology support services division. **Quinton Martin**, previously manager of commercial systems for corporate data processing, has been named manager of commercial systems for the comptroller's staff. **Orval Hughlett**, formerly supervisor of the performance control section, has been named branch manager for performance control.



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CALENDAR

NOVEMBER 2-8

ADAPSO 65th Management Conference. Phoenix, Nov. 2-5 — Contact: ADAPSO Education Dept., Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

1986 NAWGA Computer Conference and Expo. Atlanta, Nov. 2-5 — Contact: National-American Wholesale Grocers' Association, 201 Park Washington Court, Falls Church, Va. 22046.

Fall Joint Computer Conference '86. Dallas, Nov. 2-6 — Contact: Stanley Winkler, FJCC '86, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Managing the Information Resource. Los Angeles, Nov. 2-7 — Contact: Office of Executive Education, Graduate School of Management, University of California, Los Angeles, Calif. 90024.

Disoss Implementation. Washington, D.C., Nov. 3-4 — Contact: The Georgetown Group, Inc., Moore-McCandlish House, 3950 Chain Bridge Road, Fairfax City, Va. 22030. Also being held Nov. 5-6 in Washington, D.C. and Dec. 8-9 and 10-11 in New York.

Dyl-Inquiry Users Group Meeting. Chicago, Nov. 3-4 — Contact: Product Manager, Sterling Software, Dylakor Division, 17418 Chatsworth St., Granada Hills, Calif. 91344.

Automated Manufacturing Exhibition and Conference. Greenville, S.C., Nov. 3-6 — Contact: Allen F. Barney, AM86, P.O. Box 5616, Greenville, S.C. 29606.

Electronic Imaging '86. Boston, Nov. 3-6 — Contact: MG Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

Long Range Information Systems Planning. Washington, D.C., Nov. 3-6 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Standards Technology for Distributed Information and Telecommunications Systems. Boston, Nov. 3-7 — Contact: Omnicom, Inc., Suite 304, 501 Church St. N.E., Vienna, Va. 22180. Also being held Dec. 15-19 in Denver.

Information and Telecommunications Systems. Boston, Nov. 3-7 — Contact: Omnicom, Inc., Suite 304, 501 Church St. N.E., Vienna, Va. 22180. Also being held Dec. 15-19 in Denver.

Corporate Electronic Publishing. Saddlebrook, N.J., Nov. 4 — Contact: Texet Corp., 37 Broadway, Arlington, Mass. 02174. Also being held Nov. 5 in Atlanta, Nov. 6 in Chicago and Nov. 7 in Seattle.

EDP Audit Update Seminar. Waltham, Mass., Nov. 4 — Contact: EDP Auditors Association, Inc., New England Chapter, P.O. Box 516, Boston, Mass. 02102.

North American Telecommunications Association Convention & Exhibition Showcase. St. Louis, Nov. 4-7 — Contact: NATA, Suite 550, 2000 M St. N.W., Washington, D.C. 20036.

Fourth Annual Computer and Electronics Show. Hartford, Conn., Nov. 5-7 — Contact: Daniels Productions, Inc., 1155 New Britain Ave.,

See **CALENDAR** page 80



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You're the kind of person who's very serious about personal computers. The kind of person who will never settle for just a powerful machine. Or just a compatible machine. Because you want them both. You're a Power User.

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A Powerful Family Performance

For starters, the most powerful of three new IBM System/36 models has internal performance approximately 50 percent faster than was previously available. It has 3-1/2 times more memory capacity, which can mean significantly improved performance for your data processing and departmental office environments.

There are six new models of the IBM System/38 with a lower low end and a higher high end. The smallest system has internal performance approximately 30 percent faster than its predecessor —and costs 30 percent less. The biggest has twice the internal memory of earlier models.

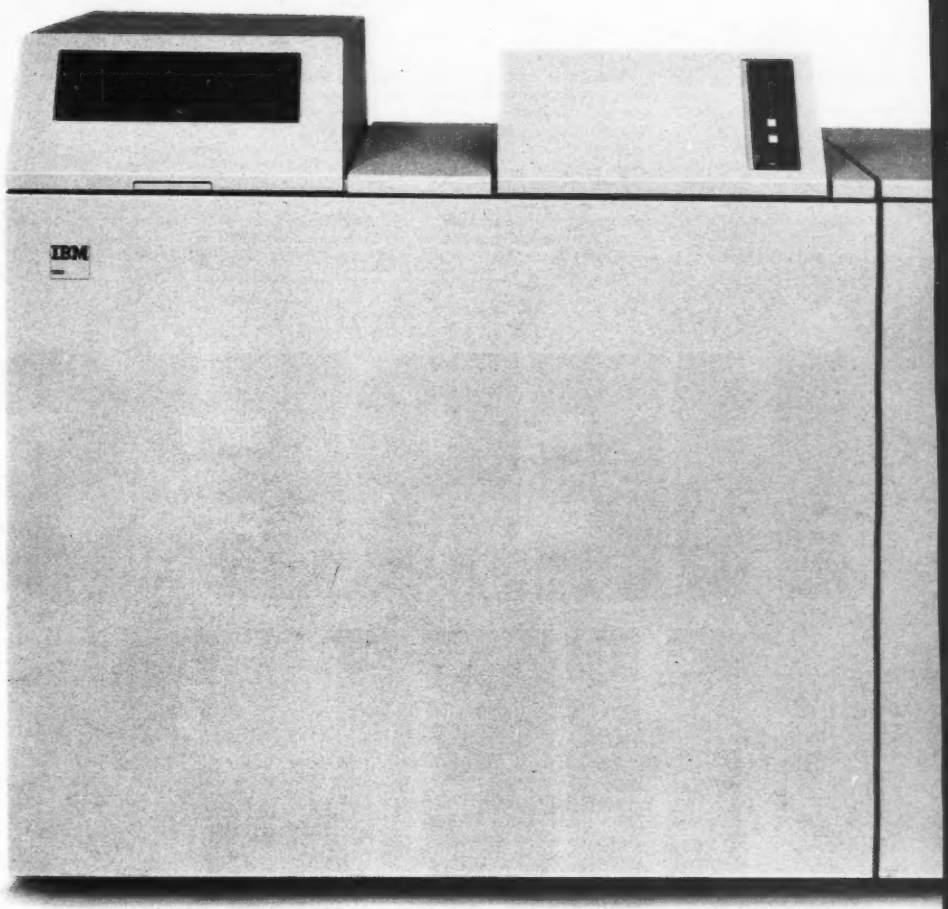
As your business grows, so can your systems. You can now go from two to 72 locally attached workstations with the IBM System/36 and up to 256 with the System/38.

Family Technology

Advanced IBM technology is included in models of the System/36 and System/38. For instance, IBM's one-million-bit memory chips and two new

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IBM System/36

state-of-the-art direct access storage devices. The new storage devices can quadruple capacity on one model of the System/36 and double it on the larger System/38's. And on the System/38 the new storage devices can take up less floor space.

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So now businesses with IBM System/36 and System/38 computers in a network can share information and resources more easily and less expensively than ever.

They can operate together supporting data processing and office applications.

For instance, System/36 users can now access and use applications on the System/38. And users of either system can share data with another System/36, a System/38, or an IBM System/370 processor.

What does all this tell you?

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So whether you side with a System/36 or a System/38, or both, the best way to keep a growing business communicating is to keep it all in the family.

IBM®

Grilling consultants

From page 69

And you need to know what they did on the projects cited. Not everyone can be in charge of every engagement. Yet if you read standardized consulting firm resumes, that's what you would believe.

• Can you have specific references for each person? Do not accept the assurance that you do not need these, as the reputation of the firm will protect you. It won't. Even if the firm makes good on its people's mistakes, you still suffer massive aggravation. So insist on references, with specific names and phone numbers. Check those references carefully. Seek additional individuals in the referenced companies from whom you can gather more detailed information.

• Will the firm guarantee that specific people will be assigned to you? In years of reviewing and writing proposals, I've seen a tremendous tendency to throw the kitchen sink into proposals — dozens of resumes featuring the firm's stars, the well-known names, published authors, etc. Very impressive, but when you meet the team that's going to work for you, the heavy hitters are strangely absent. The so-so hitters are absent. You are faced with consultants of uncertain genus and species. Too bad. You should have insisted on a staffing commitment. Consulting firms are loathe to give these since, as they will tell you, their work load varies, and you haven't committed to them, either. But insist on them.

• Who will pay for an unsuitable consultant? Unless you set it up in advance, the answer, in general, is you. It's bad enough that the fool they sent put your project back a month. They bill you at high rates for the time that was wasted.

Seek an agreement whereby if a consultant proves to be incompetent or unsuitable in your sole judgement within a stated period, the consulting firm is responsible for providing a replacement, subject to your approval, and you will not be billed for the time of the unsuitable consultant.

Of course, to make this provision useful, you have to put every consultant to the test quickly. Do they fit in your environment? Do they know what they're doing? Do they have the experience they claim?

• Can you interview the proposed staff members? Push hard for this right. The senior consulting people and sales people may be very different from those who do the work. Often, you can tell in a short interview if you're headed for trouble.

I'd make three suggestions for these interviews. First, prepare for the interview. Have hard questions ready. Second, interview the person without anyone else from the consulting firm present. The person should stand or fall on his own. Challenge the knowledge areas on the person's resume. Probe. Finally, seek additional references from the person.

You are your firm's primary defense against incompetent and unprofessional consultants. To carry out this responsibility, you must maintain vigilance from the time the proposal is received until the job is done. It isn't easy to do, and it's often tedious, but it's vital.

HERE'S HELP



Attachmate has answers to your questions about micro-mainframe communications. Hardware answers, software answers and now a guide packed full of answers to some important questions—questions worth asking *before* you make long-term decisions.

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QA group sought

A group of data processing professionals has formed a task force to launch a national Information Systems Quality Assurance Association.

The task force includes members of local quality assurance associations around the country and is spearheaded by members of the Cleveland Quality Assurance Association.

The effort to form the national group, begun earlier this year, is "alive and well," according to task force Chairman Pat P. Ragozzino. . "There is a lot of interest," he said.

The chief thrust of the task force now is to orchestrate an organizational meeting for the national association that would bring potential members to a central location, perhaps Cleveland or Chicago, Ragozzino said.

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Perhaps the best way to describe it is "the best of both worlds." And that's just why we thought it deserved a category of its own: the Midframe.

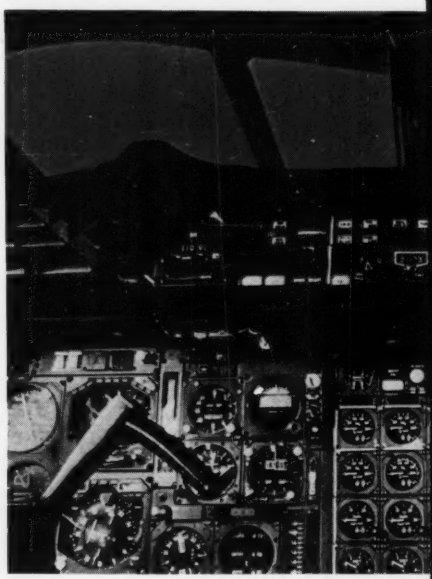
Suppose you are looking for a departmental or single-solution computer. A minicomputer would be your natural choice.

But let us tell you why the Midframe would be a better choice. Like a minicomputer, our Midframe is small, requiring less space than an ordinary desk.

It's not fussy about temperature or humidity, so you can install it anywhere.

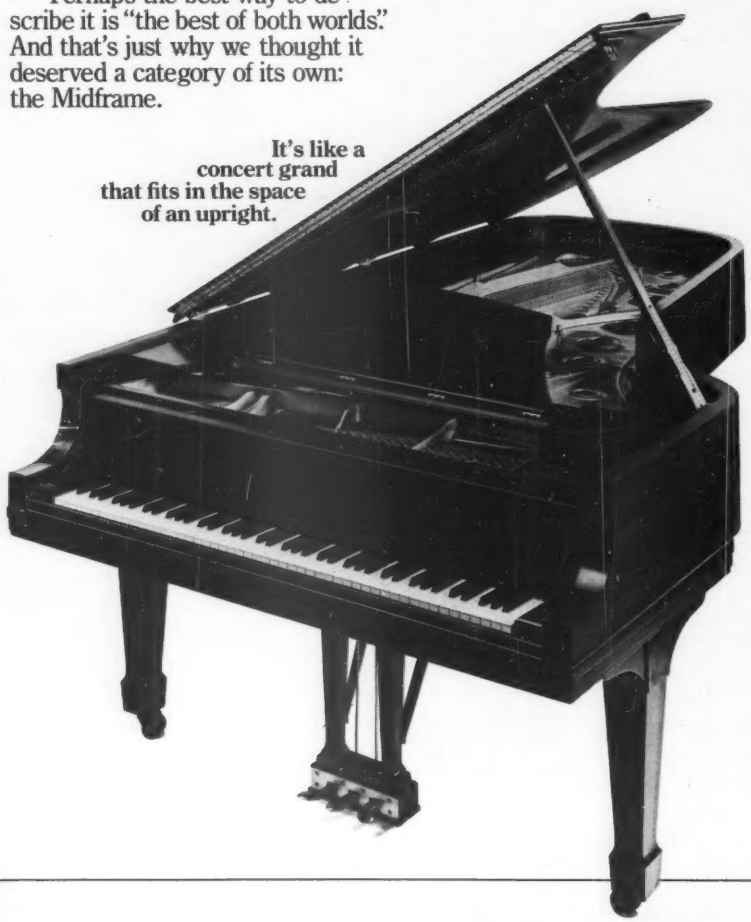
You can do it yourself, too, by simply connecting a few plugs.

It even plugs into a standard 220-volt outlet.



It's like a Concorde

It's like a concert grand that fits in the space of an upright.



And like a minicomputer, the Midframe is easy to use. We've created a software package called SHIELD that lets just about anybody in your office use it, without extensive training.

What's more, it's priced like a minicomputer.

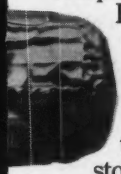
But to judge the Midframe by its performance, you'd swear you were looking at a mainframe. As a matter of fact, the Midframe is

It's like a family car with the power of a race car.

Anderson & Lembke

uter almost defies description.

powerful enough to serve as a host computer for most midsized companies.



In its most basic form, a single processor unit, the Midframe offers up to 6 Megawords (24 MB) of main storage, and more than a billion bytes of mass storage in the main cabinet. It can grow, as your computer needs do, into a four-processor system with 12 Megawords (48MB) of main storage.

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The Midframe offers enormous connectivity, not only to Sperry computers, but to those made by IBM and others.

If you're wondering how the Midframe can be both a mainframe and a minicomputer at the same time, there's a very simple answer.

That answer lies in a new chip technology developed by Sperry, called CMOS III/VLSI.

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If you're looking for a departmental computer, consider a Midframe. It offers you mainframe capability for about the same money as a minicomputer.

And if you are looking for a host system, the Midframe is a mainframe that can grow with you, at far less than you'd expect to pay.

Would you like to know more about the Midframe?

Just call Sperry today toll-free at 1-800-547-8362 Extension 8.

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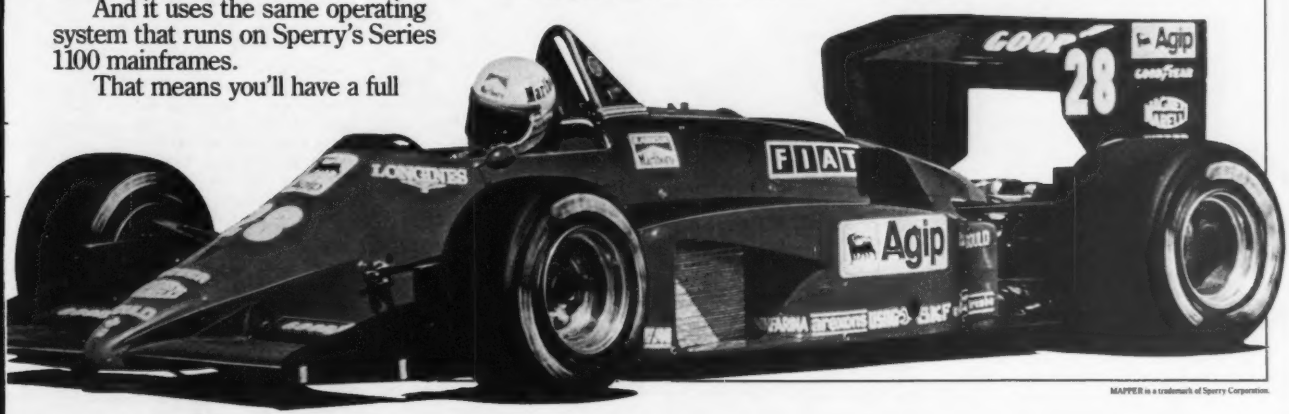
SPERRY



you can fly yourself.



It's like a dinghy that can grow to the size of a ketch.



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Investors scan broker data base

From page 69

individual brokerages offering only that firm's analysis.

"What's available now is the ease with which we can get reports and get them from multiple sources on the same subject," says Joseph Fitzgerald, vice-president and director of investment research at Bankers Trust Co. in New York.

"I have mounds of paper on my desk. It used to panic me that I wasn't reading it all," says Tony Kreisel, director of research at Boston's Endowment Management and Research Corp. Kreisel says he searched the paper reports to find the 2% of it that was worthwhile to him. Now he gets most of the same data sooner and with the ability to search it electronically.

> ***Clients are generally mutual fund firms and other private money managers, investment departments of banks and insurance companies and arbitrageurs, who speculate in securities on the basis of takeovers and similar dealings.***

Fidelity Management & Research Co., a mutual fund firm in Boston, used to get morning meeting notes from brokerages and wanted more, says Cathy Stephenson, director of information research library services. "We like being able to get at that information quickly," she claims.

Fitzgerald notes that he can print out information from First Call, an advantage when supporting 30 portfolio managers and satellite offices. "It's just not easy to call everyone together," he says. Bankers Trust analysts can annotate printouts disagreeing with analyses, for example, he added.

Ownership of First Call Corp. is split among Business Research Corp. of Boston, with 52%, and the six brokerage firms, which each hold 8%. Four other brokerages each pay $120,000 a year to contribute analyses to the service.

Part-owners and contributors

The part-owners are Cyrus J. Lawrence, Inc.; Donaldson, Lufkin & Jenrette Security Corp.; Drexel Burnham Lambert Group; The First Boston Corp.; Morgan Stanley & Co.; and Smith Barney Harris Upham Co. Other contributors are Alex Brown & Sons; Cowen & Co.; Kidder-Peabody & Co.; and Paine Webber Group, Inc.

Business Research, producer of Investext, an archival investment data base, is run by Jeffrey Parker, a former Fidelity Investments Co. portfolio manager. The company was purchased Oct. 14 by Toronto's International Thompson Organization Ltd., a publishing and information services concern.

In 13 months of sales, First Call has lined up 150 clients who pay $18,000 a year, plus $6,000 for each additional terminal. The base charge includes maintenance, support and upgrades.

No cancellations

So far there have been no cancellations, says Bruce Fador, First Call's national sales manager. "It's nice to see a product live up to all your marketing hype," he says.

Clients are generally mutual fund firms and other private money managers, investment departments of banks and insurance companies and arbitrageurs, who speculate in securities on the basis of takeovers and similar dealings.

Prospects who declined to subscribe to First Call cited the cost, the fact that it does not offer analyses from more brokerages and a desire to get data through a stand-alone computer on a dial-up basis, Fador says.

First Call's Televideo personal computers replaced AT&T 6300s after installations with Olivetti Corp.-built machines suffered hard disk crashes and about a 40% failure rate, Fador says.

The host processors are a Digital Equipment Corp. VAX 8650 at Strategic Information, Inc. of Burlington, Mass., a time-sharing firm, and a VAX 750 at First Call headquarters.

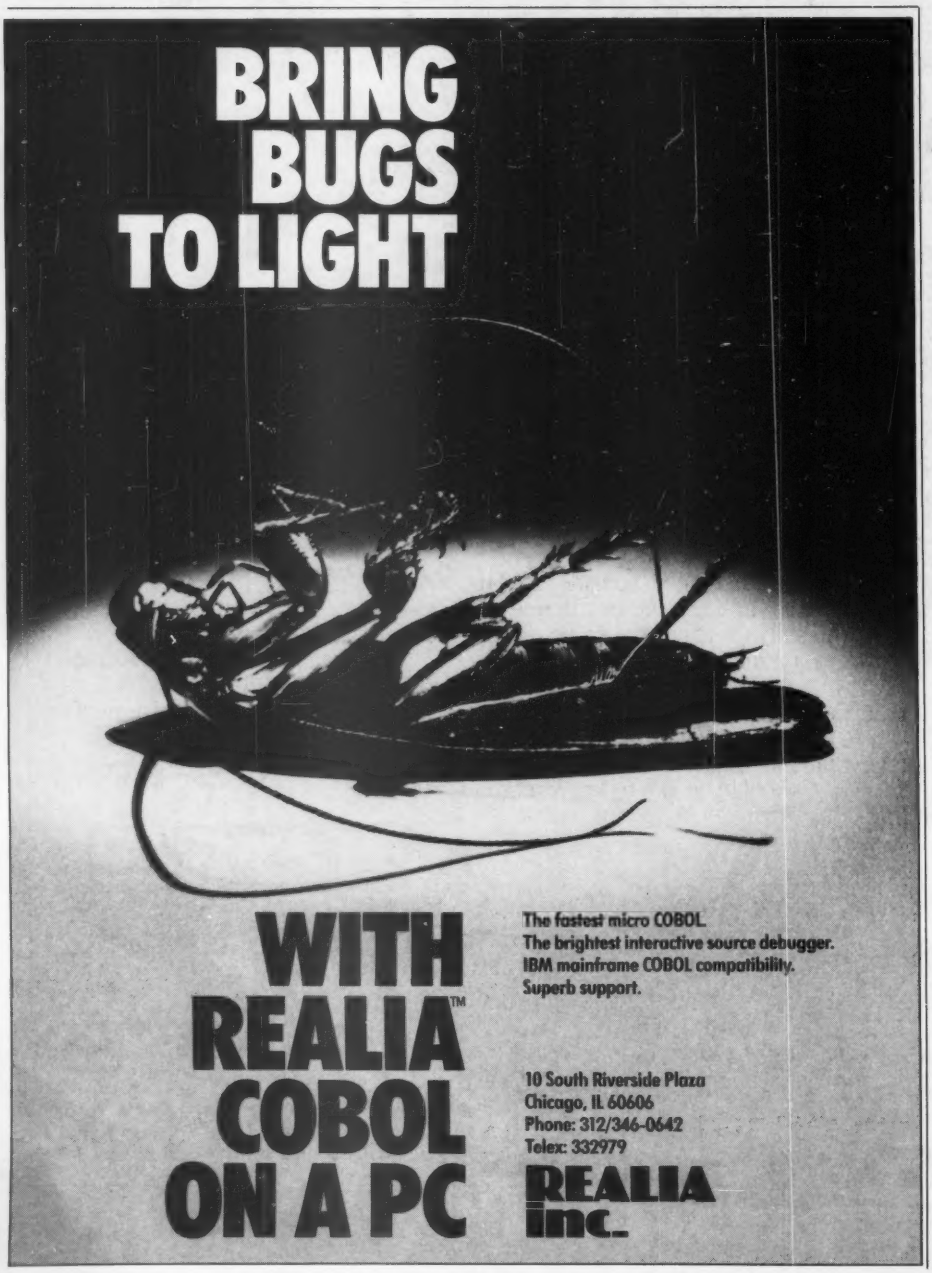
Information is transmitted through transponder space on the Westar4 satellite that is leased through Equatorial Communications Co.

Network linkage

The Televideo computers can be linked with networks from 3Com Corp., Novell, Inc. and others. Networks with as many as 50 computers are installed at clients such as Citicorp, IDS Financial Services, Inc. and Shearson Lehman Brothers, Inc., Fador says.

Fador declined to characterize First Call's earnings except to say the company is profitable and the earnings involve "a fairly complex set of numbers" because of the numerous owners and other bookkeeping complexities.

First Call has 10 subscribers in London, which receive the service via telephone lines. Plans for next year call for satellite distribution in Great Britain, adding analyses from London brokerages and expansion to Tokyo, Fador says.





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CALENDAR from page 70
West Hartford, Conn. 06110.

Scientific Computing & Automation Conference and Exposition. Atlantic City, Nov. 5-7 — Contact: Anthony Scalisi, Expocon Management Associates, Inc., 3695 Post Road, Southport, Conn. 06490.

Second Annual Conference on Optical Storage for Small Systems. Los Angeles, Nov. 5-7 — Contact: Technology Opportunity Conference, 256 Laguna Honda Blvd., San Francisco, Calif. 94116.

National ACH Originators Seminar. Atlanta, Nov. 6 — Contact: Manager of Meeting Services, National Automated Clearing House Association, Suite 640, 1901 L St., Washington, D.C. 20036. Also being held Dec. 3 in Dallas.

National Corporate ACH Seminar. Atlanta, Nov. 6 — Contact: Manager of Meeting Services, National Automated Clearing House Association, Suite 640, 1901 L St., Washington, D.C. 20036. Also being held Dec. 3 in Dallas.

Second Annual Software Management Strategies Conference. Toronto, Nov. 6-7 — Contact: Gartner Group, Inc., 72 Cummings Point Road, Stamford, Conn. 06902.

NOVEMBER 9-15

Applied Business Technology Corp.'s 2nd Annual Users Conference. New York, Nov. 9-10 — Contact: Makovsky & Co., 245 Fifth Ave., New York, N.Y. 10016.

Information Industry Association 18th Annual Convention & Exhibition. New York, Nov. 9-12 — Contact: IIA, Suite 800, 555 New Jersey Ave. N.W., Washington, D.C. 20001.

Information Center Implementations: Real Issues. New York, Nov. 10 — Contact: Atre International Consultants, Inc., P.O. Box 727, 16 Elm Place, Rye, N.Y. 10580.

The Information Goldmine. New York, Nov. 10-12 — Contact: Information Industry Association, Suite 800, 555 New Jersey Ave. N.W., Washington, D.C. 20001.

Association for the Development of Computer-Based Instructional Systems Annual Conference. Crystal City, Va., Nov. 10-13 — Contact: ADCIS, Room 409, Miller Hall, Western Washington University, Bellingham, Wash. 98225.

Computers & Management for Contractors Conference & Exposition. San Francisco, Nov. 10-13 — Contact: Irene Nelson, Fleishman & Linden Expositions Group, 2401 Plum Grove Road, Palatine, Ill. 60067.

International Conference on Computer-Aided Design. Santa Clara, Calif., Nov. 10-13 — Contact: IEEE Computer Society, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Comdex/Fall '86. Las Vegas, Nov. 10-14 — Contact: The Interface Group, 300 First Ave., Needham, Mass. 02194.

T-1 and SDN: Seizing Economic Control of the Network. Nov. 11-12, New York — Contact: The Yankee Group, Seminar Division, 14th Floor, 89 Broad St., Boston, Mass. 02110.

Autofact '86 and Sensors '86. Detroit, Nov. 11-14 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Educom's 22nd Annual Conference. Pittsburgh, Nov. 11-14 — Contact: Carol Parysz, Educom, P.O. Box 364, Princeton, N.J. 08540.

Electronic Demand Publishing. Washington, D.C., Nov. 12-14 — Contact: Gail Montgomery, Conference Registrar, Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

National Conference on Building and Operating Defect-Free Software. Orlando, Fla., Nov. 12-14 — Contact: Quality Assurance Institute, 9222 Bay Point

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Drive, Orlando, Fla. 32819.

NOVEMBER 16-22

ATM9-Electronic Delivery Systems Conference. Los Angeles, Nov. 16-19 — Contact: Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

S.I. Users Group's 19th Semiannual Conference. Boston, Nov. 16-19 — Contact: Software International, 1 Tech Drive, Andover, Mass. 01810.

Introduction to Human Resource Information Systems. Seattle, Nov. 17-18 — Contact: Association of Human Resource Systems Professionals, P.O. Box 8040-A202, Walnut Creek, Calif. 94596. Also being held Nov. 20-21 in Houston.

Managing the Strategic Data Planning Project. San Francisco, Nov. 17-19 — Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Dec. 17-19 in Boston.

Strategic Issues in Managing Information Technology: Achieving Significant Improvements in Productivity and Effectiveness. Cambridge, Mass., Nov. 17-19 — Contact: Decision Support Technology, 51 Church St., Boston, Mass. 02116.

Thirteenth Annual Computer Security Conference. Atlanta, Nov. 17-19 — Contact: Computer Security Institute, 360 Church St., Northboro, Mass. 01532.

1986 CIPS Conference. Toronto, Nov. 17-20 — Contact: Canadian Information Processing Society, 5th Floor, 243 College St., Toronto, Ont., Canada M5T 2Y1.

Managing the Power of Information. Washington, D.C., Nov. 18 — Contact: Association for Information and Image Management, 1100 Wayne Ave., Silver Spring, Md. 20910.

Localnet '86, International Open Systems Conference and International ISDN Conference. San Francisco, Nov. 18-20 — Contact: Online International, 989 Avenue of the Americas, New York, N.Y. 10018-5485.

Writing Better Computer Software Documentation for Users. Tempe, Ariz., Nov. 19-20 — Contact: Center for Professional Development, College of Engineering and Applied Sciences, Arizona State University, Tempe, Ariz. 85287.

NOVEMBER 23-30

Conference for Artificial Intelligence/Expert Systems. Boston, Nov. 24-25 — Contact: Software Tools Conference, Suffolk University, Boston, Mass. 02108.

Software Tools for Artificial Intelligence Expert Systems. Boston, Nov. 24-25 — Contact: Software Tools Conference, Suffolk University, Boston, Mass. 02108.

Satellite Telecourse on Distributed Processing. Atlanta, Nov. 24-26 — Contact: Association for Media-Based Continuing Education for Engineers, Inc. Satellite Network, 500 Tech Pkwy. N.W., Atlanta, Ga. 30313.

NOV. 30-DEC. 6

Engineering Workstations and the PC. Bedford, Mass., Dec. 1-3 — Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Optical Fiber Communications. Colorado Springs, Dec. 1-5 — Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

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Subsidiaries: VM Software (UK) Ltd., Reading, Berks., UK, Telex 85184992; VM Software GmbH, Frankfurt, W. Germany, Telex 841411204.

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VM SOFTWARE INC.

NEW PRODUCTS

Fujitsu line expanded with three drives

The Storage Products Division of Fujitsu America, Inc. of San Jose, Calif., has expanded its product line with the introduction of a 51M-byte, 3½-in. Winchester disk drive, a 690M-byte, 8-in. Winchester disk drive and a 172M-byte, 5¼-in. Winchester disk drive with an embedded intelligent small computer system interface (SCSI) controller.

The 3½-in. drive, designated the M2227D, is said to provide a 40-msec average positioning time and a 625K bit/sec. transfer rate. Data is recorded at 12.5K bit/in. by means of modified frequency modulation recording.

The unit is available with an optional mounting form that allows it to fit standard half-height, flexible or Winchester disk-drive slots in personal and portable computers.

The card is priced at $695 in quantities of 100.

The M2344K/KS 8-in. drive features positioning time of less than 18 msec, the vendor claimed, a 2.458M bit/sec. transfer rate and modified storage module drive interface.

The drive contains eight media disks and 27 read/write heads. It can be rack mounted side by side to provide 1.38G bytes of storage in a standard 19-in. rack.

The M2344K/KS is priced at $8,400 in quantities of 100.

The M2246S 5¼-in. Winchester disk drive features a 25-msec positioning time and 1.25M bit/sec. SCSI transfer rate. The embedded SCSI controller utilizes the American National Standards Committee SCSI and also implements the common command set specification.

Incorporated into the drive are the Fujitsu SCSI Protocol Converter and other custom large-scale integration. The drive features six disks and 10 read/write heads. It offers a 20.864K-byte track capacity, 823 cylinders and a rotation speed of 3,600 rpm. The M2246S is priced at $1,595 in quantities of 100.

According to the vendor, all three products will be available early in 1987.

Issco releases two visual project management software packages

Integrated Software Systems Corp. (Issco) of San Diego, Calif., has announced two visual project management software packages, Tellaplan Professional and Tellaplan Expert.

The products, based on Issco's multiuser Tellaplan I, combine advanced project planning, tracking, scheduling and monitoring functions with Issco's high-quality graphics for visual reporting on systems ranging from workstations to supercomputers, according to company representatives.

Tellaplan Professional combines Gantt chart reporting with start-to-end and end-to-start planning; planning in hours, days, weeks and months; human resource and arbitrary units; milestones and benchmarks; and dependency designation. It can handle up to 2,000 tasks.

Tellaplan Expert, a superset of Tellaplan Professional, adds Program Evaluation and Review/CPM charting in two formats, activity-on-arrow and activity-on-node; work break-down structures; cost and resource analysis and charting; and 24-hour calendar control. It handles up to 10,000 tasks.

Both packages allow consolidation of multiple plans for reporting, critical path reviews, "what-if" simulations and incorporation of slack time and dependencies using conversational English commands or an optional prompting system.

According to a company spokesman, the new products considerably enhance Tellaplan I's project management capabilities while continuing to offer high-quality graphics for reports and analysis. Users of Tellaplan I will receive a free upgrade to Tellaplan Professional and a discount on upgrades to Tellaplan Expert.

Delivery is scheduled to begin in October and extend into November for the different versions of the packages, with prices varying by system.

For the Digital Equipment Corp. VAX 8600 and IBM's 3031 and 4341 systems, Tellaplan Professional is $17,500 and Tellaplan Expert, $37,500. For IBM 3084 and 3090 Model 200 systems, prices are $32,500 and $58,500. Versions for the IBM 3090 Model 400 and Cray Research, Inc. Cray 2 will cost $42,900 for Tellaplan Professional and $71,000 for Tellaplan Expert.

Portable protocol analyzer out

Network General tool for Token-Ring network

Network General Corp. of Sunnyvale, Calif., has announced The Sniffer, a portable protocol analyzer for the IBM Token-Ring network.

The Sniffer is said to operate as a self-contained unit for data collection, recording and analysis, in addition to functioning as a real-time system performance monitoring instrument. It can be set up to watch for a trigger event, which will provide data needed for problem analysis.

The Sniffer can collect all or a subset of frames at full network speed, the vendor said. Frames can then be saved on disk for later analysis. Source routing information on the network may be collected as well.

The frame types supported include IEEE 802.5 MAC; IEEE 802.2 Type 1 and Type 2 LLC; IBM's Netbios; SMB; and LU6.2. According to the vendor, additional user-specified protocols may be added by use of the C programming language.

The Sniffer is also said to aid the reverse engineering of network protocols and provide for performance analysis of the Token-Ring network during pilot tests.

The Sniffer features 640K bytes of random-access memory and 20M bytes of ruggedized hard-disk storage. Users may connect to an external red-green-blue monitor for color display.

The Sniffer is priced at $19,995 per unit.

INSIDE

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printf("Hello, IBM world\n");

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We designed the compiler listing and cross-reference to make programs easy to follow and errors easy to find. An extensive library offers functions from Kernighan and Ritchie and the Lattice PC C compiler. The run-time library produces explicit numbered error messages and a traceback of active function calls if an error occurs.

For all the facts—including details on economical annual licensing complete with free technical support and enhancements—call your Software Sales Representative today.

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SAS Institute Inc.
Box 8000, SAS Circle
Cary, NC 27511-8000
(919) 467-8000 Telex 802505

SOFTWARE & SERVICES

Systems software

Control Data Corp. has announced the **ICEM 793G Application Processor** for its Integrated Computer-aided Engineering and Manufacturing (ICEM) system.

The ICEM 793G is said to be integrated with the ICEM system to provide access to the system's range of computer-aided design and computer-aided manufacturing software. It can operate as a stand-alone workstation when combined with one of six terminal options and an ICEM software package or can be linked to a central Control Data Cyber 180 host computer for access to data base management and analysis resources.

The ICEM 793G Application Processor is priced from $22,585 to $47,500.

Control Data Corp., HQN03N, P.O. Box 0, Minneapolis, Minn. 55440.

Applications packages

Apollo Computer, Inc. has announced that Autodesk, Inc. has ported its **Autocad** software to Apollo's Domain workstations.

Autocad users can transfer Autocad files to the Apollo Series 3000 workstations using Apollo's Personal Computer Interconnect (PCI). PCI can connect up to eight personal computers to a single Series 3000. Via the Domain network, each PC user can store files on the Domain system, communicate with other PCs and workstations and share peripheral devices.

Autocad Version 2.5 for Domain workstations is priced at $2,750.

Apollo Computer, 330 Billerica Road, Chelmsford, Mass. 01824.

■

Xenergy, Inc. has announced **Agricap**, an energy analysis software package for the agricultural industry.

The software is said to evaluate the energy efficiency of irrigation systems, crop-drying technologies, refrigeration needs, feed-processing techniques and heating methods for housing livestock. According to the vendor, Agricap can be customized by the end user.

In addition to performing analyses, the software uses the data collected to build data bases. It also outputs customized reports.

Agricap is priced from $10,000 to $15,000.

Xenergy, 60 Mall Road, Burlington, Mass. 01803.

Languages

Language Processors, Inc. has ported its **LPI-RPG II** compiler to Sperry Corp.'s 5000 series computers running AT&T's Unix System V.

The compiler is said to be compatible with IBM System/3 and System/34 computers. It is also said to provide support for IBM's Operation Control Language preprocessing language. LPI-RPG II offers cross-language calling.

LPI-RPG II costs from $3,000 to $6,000.

Language Processors, 400-One Totten Pond Road, Waltham, Mass. 02154.

■

Fortune Systems Corp. has announced a multiuser version of **Level II Cobol Enhanced Technology (ET)**, Version 1.1.2, developed by Micro Focus Ltd. for its 32:16 and Multiplier subsystems.

According to the vendor, the version allows large existing ANSI 74 Cobol applications written for minicomputers and mainframes to be transferred to Fortune's hardware with minimal code modification.

Features include performance analysis tools, optimized memory utilization and the allowance of up to 800M bytes of code and addressable data items as large as 256M bytes.

The Compiler and Runtime modules of Level II Cobol ET cost $2,195. The Runtime Module alone costs $1,795 and the Developer Package costs $495.

Fortune Systems, P.O. Box 28, Mt. Eden, Calif. 94557.

Utilities

Cadam, Inc. has announced the **Data Transfer** product for its IBM Personal Computer AT-based Micro Cadam.

The bidirectional Data Transfer is said to enable Micro Cadam users to transfer design and drawing files to and from the mainframe-based Cadam Interactive Design using standard IBM 3270 file-transfer procedures. According to the vendor, work done on mainframes can be downloaded and manipulated on the desktop systems.

The Micro Cadam Data Transfer product costs $1,250.

Cadam, 1935 N. Buena Vista St., Burbank, Calif. 91504.

■

Visionics Corp. has announced the **EE Designer Autorouter** software module designed for use with the EE Designer computer-aided engineering and computer-aided design package.

The Autorouter module is said to perform automatic routing of printed circuit board traces.

It can be used with boards that have an associated net list, boards that have been rat-nested or on a simple pin-to-pin basis.

Autorouter operates in an interactive graphics mode, allowing a mix of automatic routing and manual techniques. The module was designed for trace-layer operation on double-sided boards.

The Autorouter costs $975.

Visionics, 1284 Geneva Drive, Sunnyvale, Calif. 94089.

Data base management systems

Relational Technology, Inc. has announced **Ingres for Amdahl UTS-3270** environment for IBM and compatible mainframes.

Ingres for UTS-3270 is said to allow Ingres users to run applications on IBM 3270 block-mode terminals.

It is available as an option to the basic Ingres UTS product, according to the vendor.

The 3270 user interface is compatible with Relational Technology's Ingres products for the VM/CMS environment.

Ingres for UTS-3270 is priced from $8,000 on the IBM 4331 to $28,000 on the IBM 3090.

Base price for Ingres on UTS ranges from $30,000 to $140,000.

Relational Technology, 1080 Marina Village Pkwy., Alameda, Calif. 94501.

MICROS

Systems

Tatung Company of America has enhanced its IBM Personal Computer AT-compatible **Model TCS-7000**.

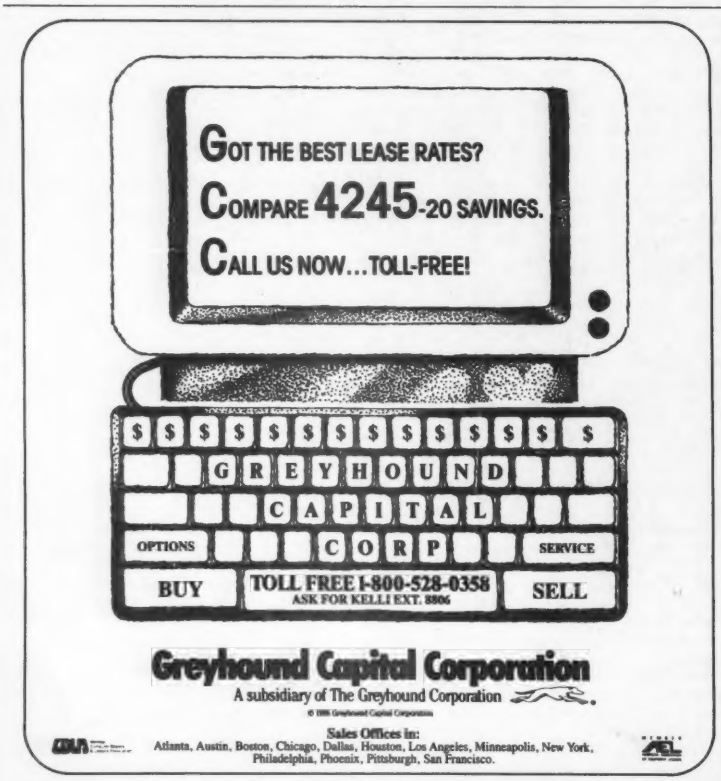
The computer now offers switchable operating modes of 6 or 8 MHz or 6 or 10 MHz, the vendor said.

It also offers 64K bytes of read-only memory and 512K bytes of random-access memory, expandable to 1M byte on the main board, according to the vendor.

Other attributes of the Model TCS 7000 include a hard-disk controller card, floppy disk controller card, one floppy disk drive and a keyboard, a Tatung spokesman said.

The Model TCS-7000 computer carries a price tag of $2,295.

Tatung, 2850 El Presidio St., Long Beach, Calif. 90810.



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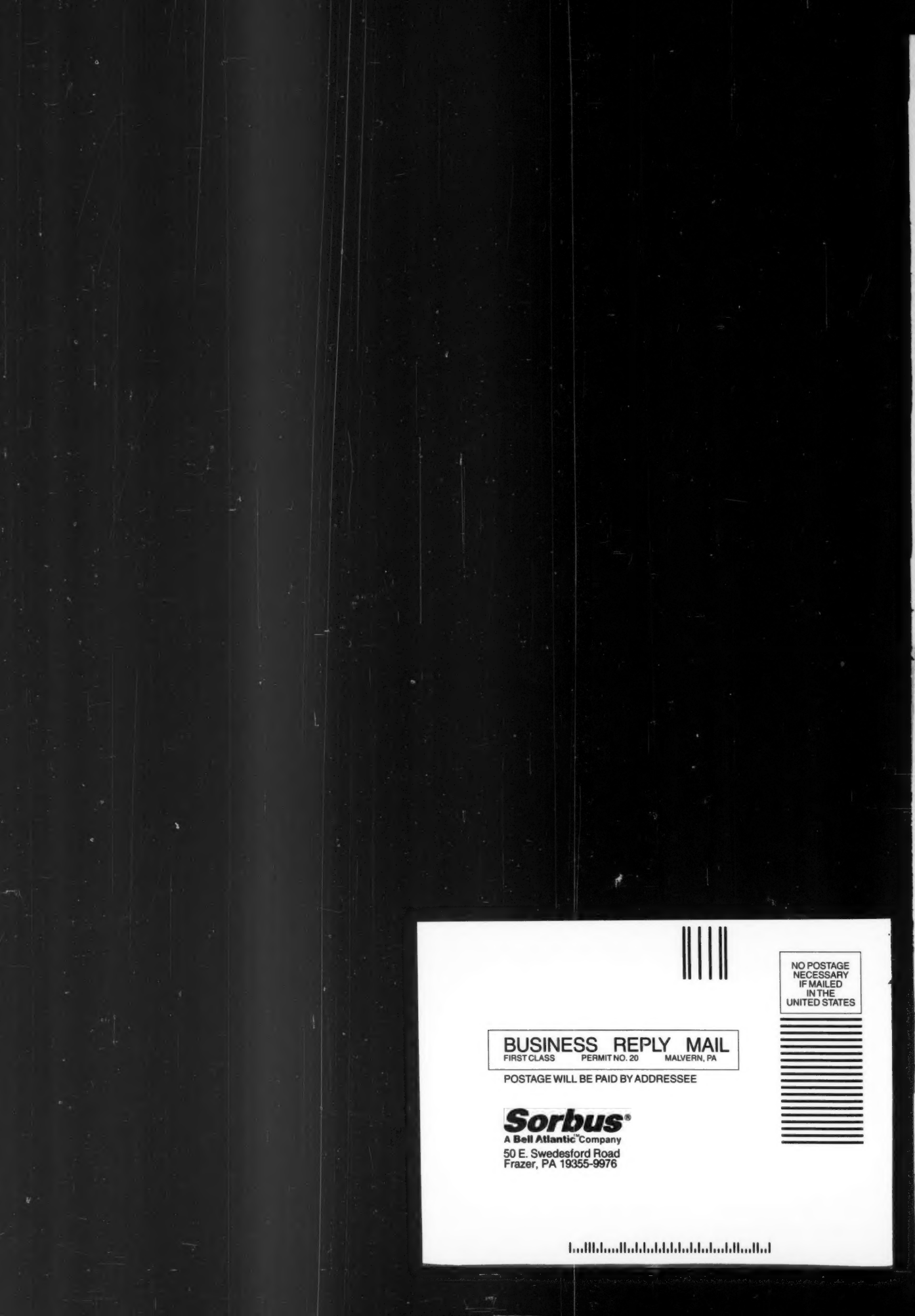
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Software applications packages

Imaging Technology, Inc. has announced its **Itex 151**, a library of image-processing and board-level control routines that is said to accelerate the development of applications programs for its Series 151 image processor product line.

The Itex 151 software includes over 200 image processing and graphics rountines.

It features board-level access and control routines, look-up table operations, image filtering and convolutions and graphics.

Other attributes of the Itex 151 include image geometry, image processing and statistical analysis, according to the vendor.

The Itex 151 is distributed as object code on a Microsoft Corp. MS-DOS-compatible floppy disk.

It is priced at $995.

Imaging Technology, 600 W. Cummings Park, Woburn, Mass. 01801.

■

Legal Software, Inc. has introduced the **Cite Checker**, a program designed for use in law firms.

The Cite Checker is said to automatically implement the standard Bluebook legal citation form rules.

The software scans the text of legal documents and locates the citations.

The Cite Checker runs on an IBM Personal Computer or compatibles. It costs $350.

Legal Software, P.O. Box 61048, Palo Alto, Calif. 94306.

Software languages

Lattice, Inc. has introduced an **RPG II compiler** for the IBM Personal Computer and compatibles.

According to the vendor, this version of RPG II offers compatibility with EBCDIC and ASCII files and allows users to interface with the standard personal computer keyboard in a flexible manner.

Files created with the RPG II compiler are said to be compatible with Ashton-Tate's Dbase III and vice versa.

The Lattice RPG II compiler costs $750.

With the Source Entry utility and a Sort/Merge utility, the RPG II compiler costs $1,100.

Lattice, P.O. Box 3072, Glen Ellyn, Ill. 60138.

Software utilities

Acorn Plus, Inc. has announced **Easy Laser**, a software program for Hewlett-Packard Co. laser printers.

The memory-resident software allows users to format text right-justified and right-ragged edged; choose up to 55 user-selectable fonts per default file; indent, center, underline, superscript and subscript; print multicolumns; draw graphics; generate forms; and align columns.

Easy Laser is priced at $99.95.

Acorn Plus, Suite 2011, 4219 W. Olive Ave., Burbank, Calif. 91505.

Software data base management systems

Gupta Technologies, Inc. has released its **Sqlbase** data base management system for the IBM Token-Ring Network.

Sqlbase is said to be a multiuser data base management system that features a complete implementation of the IBM SQL.

It runs on IBM Personal Computers under IBM's PC-DOS 3.2.

It will also operate on any IBM Netbios-compatible network, including Novell, Inc. and 3Com Corp., the vendor stated.

The multiuser development tool kit is priced at $1,995. Single-user versions of Sqlbase are priced at $995.

Gupta Technologies, Suite 240, 1040 Marsh Road, Menlo Park, Calif. 94025.

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DECISION SUPPORT SYSTEMS: Putting Theory Into Practice
c/r 1986
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Paper (19728-5) $20.95

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Englewood Cliffs, NJ 07632

Software enhancements

D. L. Hiller & Associates has announced **Version 2** of **The Factory Data Manager.**

The software is a labor data collection system. Version 2.0 features restart/recovery capability and support for Microsoft Corp.'s Xenix and MS-DOS operating systems.

The Factory Data Manager comes on a 12-MHz IBM Personal Computer AT-compatible computer or on a software-only basis.

Prices start at $4,995.

D. L. Hiller, 14536 Island Drive, Sterling Heights, Mich. 48078.

Data storage

Texas Instruments, Inc. has announced the **Travelmate VT-100 Emulation cartridge** said to allow the Silent Travelmate 1200 to emulate the Digital Equipment Corp. VT100.

The cartridge plugs into the Travelmate 1200 and allows users to access DEC hosts. It also contains Travelmate Auto Access features that allow phone numbers and logon sequences to be stored in the cartridge.

Features of the Travelmate 1200 include a retractable, 16-line by 80-col. display, a built-in, 45 char./sec. thermal printer, a keyboard and an internal 300 to 1,200 bit/sec. modem.

The VT-100 Emulation cartridge is priced at $200.

Texas Instruments, P.O. Box 809063, H-895, Dallas, Texas 75380.

Printers/Plotters/Peripherals

Digital Products, Inc. has added a protocol converter capability to its **Printdirector** family of printer-sharing products.

The protocol converter capability is said to provide compatibility between the IBM Personal Computer AT and the Apple Computer, Inc. Laserwriter page printer.

The Printdirector allows multiple ATs to access a single Laserwriter and provides the protocol conversion required between the two machines as well as a transparent graphics mode capability, according to the vendor.

The Printdirector features 256K bytes of buffer memory expandable to 1M byte, concurrent I/O and beginning-of-job and end-of-job printer set-up controls.

The Printdirector is priced at $200 per port.

It is available in 5-, 6-, 8-, 16- and 30-port models.

Digital Products, 108 Water St., Watertown, Mass. 02172.

Board-level devices

Xmark Corp. has announced **PCplex**, a multiuser, multitasking add-in circuit board said to be compatible with IBM's PC-DOS and Microsoft Corp.'s MS-DOS.

PCplex is said to fit in any half or full slot and allows three users to use the same personal computer by attaching up to two ASCII terminals to existing ports.

The board supports up to 99 concurrent tasks on the host, supports subdirectories and time-slicing and allows applications to be run remotely via a modem or locally via an RS-232 hookup.

Prices for PCplex range from $199 to $399.

Xmark, #119, 3176 Pullman St., Costa Mesa, Calif. 92626.

COMMUNICATIONS

Controllers

Informer Computer Terminals has introduced the **ICT 281** network cluster controller.

The controller is said to connect to an IBM 3270 communications network and is plug-compatible with IBM's 3174. It can be attached through a remote communications link operating in IBM's Systems Network Architecture or bisynchronous environment. According to the vendor, it oversees mainframe communications functions, provides service to local-area networks and local and dial-up terminals and ensures security on the network.

A desktop or standing model is equipped with 16 coaxial Category A and eight ASCII lines. It costs $10,900. A tabletop unit supporting 16 Category A coaxial lines costs $5,100.

Informer, 22936 Mill Creek Road, Laguna Hills, Calif. 92653.

■

Distributed Logic Corp. (Dilog) has announced the **Model CU1710** communications controller for Digital Equipment Corp.'s PDP-11 and VAX-11.

The 16-channel asynchronous controller is contained on a single, quad-size printed-circuit board. It runs the standard DHU11 driver and diagnostics under the VAX/VME, RSTS/E, RSX and Ultrix-32 operating systems.

The unit provides full-duplex communications at software-selectable data transmission rates from 50 bit/sec. to 38.4K bit/sec.

The CU1710 is priced at $2,500.

Dilog, P.O. Box 6270, 1555 S. Sinclair St., Anaheim, Calif. 92806.

Voice/data communications

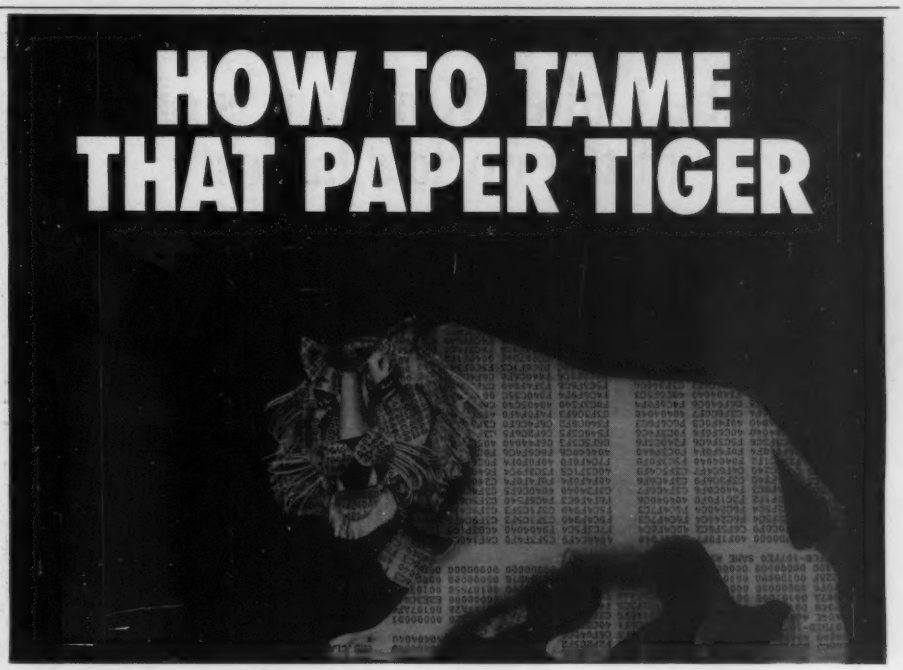
Telex Computer Products, Inc. has announced the **Telex C078** desktop voice/data terminal with integrated telephony and multiple data communications.

The terminal is compatible with IBM's 3270 information display system. It also supports ASCII communications and Digital Equipment Corp. VT220 emulation. Users can access host data as well as write and store notes and perform calculations.

The Telex C078 costs $2,695.

Telex Computer Products, 6422 E. 41st St., Tulsa, Okla. 74135.

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NEW PRODUCTS/COMMUNICATIONS

Octel Communications Corp. has announced **Automated Message Desk**, a software package that receives and delivers messages for hotel and motel guests.

The software is an enhancement to Octel's Aspen voice message system. It functions as a message operator. It activates visual or audible indicators in guest rooms to signal when messages are waiting.

The Aspen voice message system, equipped with the Automated Message Desk option, can serve hotels and motels with 50 to 3,000 rooms. It is priced from $30,000.

Octel Communications, 890 Tasman Drive, Milpitas, Calif. 95035.

Protocol converters

Computer Communications, Inc. has announced the **CQ-A/Synchronous Model 8**, said to allow microcomputer users to employ asynchronous modems to communicate synchronous IBM Systems Network Architecture data to mainframe computers.

The unit operates in conjunction with the vendor's CQ emulation software on a remote microcomputer. Error checking, security and IBM network diagnostics are available to the remote personal computer without host software changes. Each unit allows up to eight asynchronous modems to connect to a single synchronous host port.

The CQ-A/Synchronizer is available with two, four, six or eight ports. The prices are $2,495, $2,995, $3,495 and $3,995, respectively.

Computer Communications, 5380 Capital Circle N.W., Tallahassee, Fla. 32303.

Software

Datability Software Systems, Inc. has announced its **Remote Access Facility** (RAF), said to allow personal computer users to communicate with remote Digital Equipment Corp. mainframes over the Ethernet communications network.

RAF is said to move data at 100K bit/sec. RAF communicates with DEC computers using a local access and transport area-compatible terminal protocol for terminal communications. Users can maintain multiple system connections simultaneously and can switch from one connection to another.

RAF PC software costs $395 per PC. RAF software for the VAX costs $395 per PC connection.

Datability Software Systems, 322 Eighth Ave., New York, N.Y. 10001.

Network Software Associates, Inc. has introduced **AdaptSNA RJE Version 3**.

This advanced version of its micro-to-mainframe communications link for IBM Personal Computers and compatibles features an on-line, interactive tutorial/help facility, support of two concurrent printers and a configurable print spooler, according to the vendor.

It also features support of multiple logical devices, user-definable soft keys and a trace facility, the vendor said.

The software runs on any IBM Personal Computer or compatible computer with IBM PC-DOS 2.0 or higher, 256K bytes of memory and a Synchronous Data Link Control communications adapter and a synchronous modem.

AdaptSNA RJE Version 3 costs $785.

Network Software Associates, 22982 Mill Creek, Laguna Hills, Calif. 92653.

Multiplexers/Modems

Electro Standards Laboratory, Inc. has introduced its **Model 4000 Asynchronous Multipoint Line Driver**.

The unit was designed to provide full-duplex transmission over customer-owned, four-wire circuits, the vendor said.

The Model 4000 operates at data rates up to 19.2K bit/sec. over one mile of 24-gauge, twisted-pair cable. Connection is made via an RS-232 interface.

Up to 16 units can operate over one line, according to the vendor.

The two-channel device costs $260.

Electro Standards Laboratory, P.O. Box 9144, Providence, R.I. 02940.

Local-area networks

LAN Connections, Inc. has introduced its **Microwave Interface Unit** family.

The Microwave Interface unit is said to allow interconnection of Ethernet/IEEE 802.3 local-area networks (LAN) at a speed of 10M bit/sec. Designed to function with a short-haul microwave radio link, the standard unit permits single-hop connections to 4.9 miles.

The high-performance unit allows single-hop connections up to the limit of the microwave radio system. Multiple hops can be connected.

The units are designed to function between an Ethernet store-and-forward buffer and a wideband microwave radio system.

A typical complete system for interconnection up to 10 miles installed is priced from $40,000 to $60,000 for one hop.

LAN Connections, 25 N. Hancock St., Lexington, Mass. 02173.

Test equipment

Travtach, Inc. has announced **Traps**, a menu-driven personal computer-based software system said to provide automated acceptance and regression testing facilities for on-line host applications.

Traps uses the C language for keystroke capture, editing and storage of test cases. The test bed can be moved from the development cycle to the maintenance cycle via diskette. According to the vendor, it captures the

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test data, plays it back against the host application and automatically creates the mismatch file. It operates in terminal, record, play and editor modes.

Traps costs $15,000.

Travtech, One Tower Sq., Hartford, Conn. 06183.

SYSTEMS & PERIPHERALS

Processors

Infotek Systems has introduced the **MF320** and **MF340**, Hewlett-Packard Co.-compatible multifunction cards.

The cards are said to combine 2M or 4M bytes of memory with floating-point processing power on a single card. Both are said to perform transcendental and arithmetic operations and are compatible with HP 9000 Series 200/300 technical workstations.

The MF320 2M-byte board costs $2,450. The MF340 4M-byte board costs $4,250.

Infotek Systems, 1400 N. Baxter St., Anaheim, Calif. 92806.

Data storage

Qualogy, Inc. has added a **QE-2000 ESDI** (enhanced small disk interface) add-in subsystem to its QE-2000 family of storage systems.

The QE-2000 ESDI is available with a 140M-byte formatted drive or a 310M-byte formatted drive. It may be directly integrated into Digital Equipment Corp.'s BA123 World Box Chassis or BA23 Chassis.

Single-unit prices range from $3,295 to $7,495.

Qualogy, 2241 Lundy Ave., San Jose, Calif. 95131.

■

Wilson Laboratories, Inc. has announced the **MWX-1000SX Extended SMD Analyzer**, designed for testing Winchester drives with storage module drive (SMD) interfaces.

The MWX-1000SX operates at a data transfer rate of 24M bit/sec. According to the vendor, it can be used to test all the speeds of drives that use the SMD-type interface signals. The analyzer supports both fixed and soft-sector formats and data strobe offset functions.

The MWX-1000SX costs $10,983.

Wilson Laboratories, 2237 N. Batavia St., Orange, Calif. 92665.

Terminals

Hewlett-Packard Co. has introduced the **HP 9666A Operator Interface Unit**, a terminal designed for factory floor use.

The terminal features a 12-in., high-resolution color display and interactive touch-screen capability.

Other features include eight user-definable keys, two RS-422 and RS-323-C ports and a wide range of input devices, including a bar code reader.

The HP 9666A costs $6,300.

Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

■

CIE Systems, Inc. has added the **CIE 7103** to its 7100 terminal family.

The 7103 is said to give IBM System/34, 36 and 38 users full IBM 3180-2 functionality. It connects to the IBM systems through Local Data, Inc.'s Interlynx/5251 or Datalynx/5251 protocol converters and uses a 3180-2-compatible keyboard.

Features include both RS-232 and RS-422 standard host interfaces with protocol handling speeds from 110 to 19.2K bit/sec. in asynchronous mode, according to the vendor.

The CIE 7103 is priced at $645.

CIE Systems, 2515 McCabe Way, Irvine, Calif. 92714.

Printers/Plotters

Western Graphtec, Inc. has introduced **E-size plotters** for computer-aided design, manufacturing, engineering and architectural engineering applications.

The plotters use pinch roller technology with self-capping pens and offer 15 in./sec. speed and Hewlett-Packard Co. HP-GL compatibility.

The E-size plotters are priced from $6,050 to $8,950.

Western Graphtec, 12 Chrysler St., Irvine, Calif. 92718.

■

Texas Instruments, Inc. has announced the **SNA/SDLC Coaxial** option, an interface board said to allow TI Omni 800 systems printers to emulate Models 1 through 5 of the IBM 3287.

The board is said to provide connectivity for TI Omni 800 Models 810 and 880 and 885 system printers to an IBM host computer through an IBM 3174-, 3274- or 3276-compatible cluster controller.

The half-size option board uses hex transparency and costs $1,500.

Texas Instruments, P.O. Box 809063, H-892, Dallas, Texas 75380.

PRICE REDUCTIONS

Avatar Technologies, Inc. has announced price reductions on four of its **protocol converters**.

The converters are said to allow ASCII printers and terminals to be used with IBM host computers.

The Avatar PA1500, which features IBM 3270 printer emulation, is now priced at $1,295. The PA1000E, which allows ASCII terminals or personal computers to be connected to the IBM 3270 network via coaxial cable, is now priced at $995.

The PA3500 device that connects ASCII printers to IBM System/34, 36 and 38 minicomputers via twinaxial cable is now priced at $1,195. The MPA6000 multiport converter now costs $3,695.

Avatar Technologies, 99 South St., Hopkinton, Mass. 01748.

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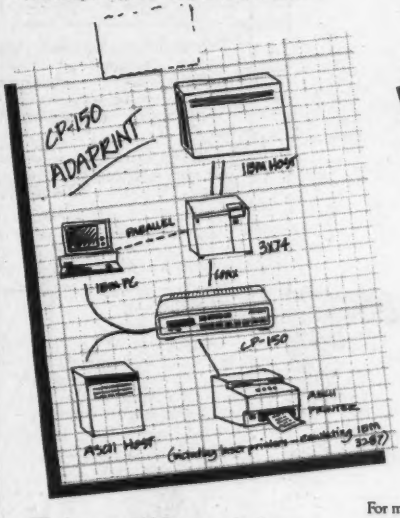
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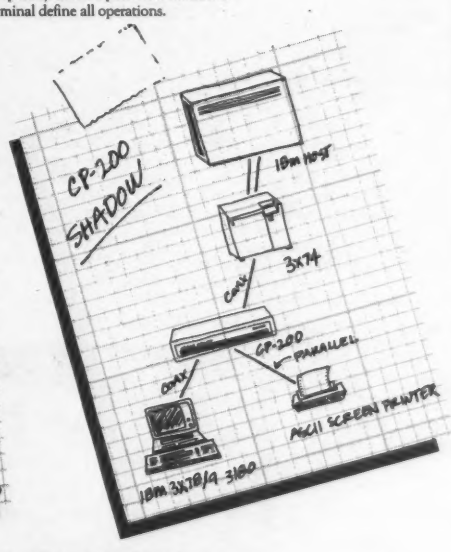
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COMPUTER INDUSTRY

Section begins on page 118

Fledgling software firm pioneers vertical marketing approach

VARs play key role in Cheyenne's strategy

By Alan Alper

ROSLYN, N.Y. — With thousands of garage shop entrepreneurs and established software vendors turning out a plethora of applications software packages for specific vertical markets, the arrival of yet another developer is as mundane as a tree sprouting in a forest. But Cheyenne Software, Inc. is hoping that a novel approach will enhance its chances of blossoming in this extremely thorny field.

Cheyenne's strategy is to develop applications software for large corporations and/or value-added resellers (VAR), which agree to remarket the packages to users. Under the arrangement, VARs do what VARs do best — remarket — and corporations, which make use of the software internally, also have an opportunity to profit by becoming resellers.

The tack minimizes the risk and increases the profit potential for both Cheyenne and its clients, notes Cheyenne President Eli Oxenhorn. Clients are saved huge software development and maintenance costs, while Cheyenne does not incure exorbitant marketing expenses, Oxenhorn explains.

Clients pay Cheyenne an up-front development fee that can range anywhere from $20,000 to $70,000. Cheyenne profits by receiving royalties on each program its clients sell.

"This way we align ourselves with the goal of the marketer," Oxenhorn says. "We create the software for a small up-front fee and rely on the success of the marketer to make our money."

The approach assures the marketer that it will always have state-of-the-art technology and continual maintenance, he adds. "We have to keep our marketers happy since it's critical to our success," Oxenhorn says.

Yet when Barry Rubenstein, a cofounder of Applied Digital Data Systems, Inc., and veteran engineer Frank Mena started Cheyenne three years ago, they had a very conventional concept. Mena had designed an applications engine using the C programming language that could be ported to a wide array of systems to substantially reduce software development time.

Rubenstein helped assemble a management team and about $2.7 million in venture capital to get the start-up off and running.

Like other young software developers at the time, Cheyenne set out to become the next Lotus Development Corp. or Ashton-Tate. Mena and Rubenstein believed they could vault the competition by building a software company that combined deep-pocket financing with innovative technology and savvy marketing.

Market research, however, dictated that there would be too many financial and marketing obstacles to overcome by taking the all-encompassing route.



Cheyenne Software's President Eli Oxenhorn

"What we found is as a start-up company, you can't be both a marketer and a technologist anymore," suggests Alan Kaufman, Cheyenne's marketing vice-president. "We looked at other businesses, such as the soft drink or automotive industries, and saw how they worked. Companies in those industries split out functions. In soft drinks, for example, you have a developer that is separate from the bottler."

From then on, Cheyenne realized that it would concentrate on applications software development for specific vertical markets using a uniform approach — and leave marketing to its strategic partners.

The company has been testing its beliefs since April, approximately six months after raising $5.75 million in an initial public offering. So far, Cheyenne has signed development agreements with a number of clients, including Chemical Bank Information Products, a division of Chemical Bank in New York; Automated Legal Systems, a division of the Institute for Paralegal Training in Philadelphia; Globe Information Systems, Inc., a software remarketer; and Fisher Business Systems, a major Atlanta-based VAR.

For Chemical Bank, Cheyenne developed an organizational analysis system that measures white-collar worker productivity, among other things. Chemical Bank began the project itself using a fourth-genera-

See **FLEDGLING** page 91

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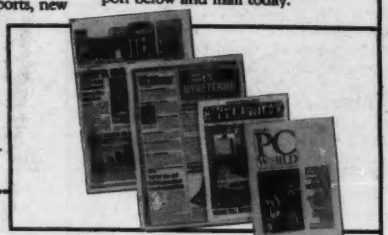
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No slumping in maintenance

From page 118

In addition to profitability, Hale pointed out that compared with hardware and software vendors, service companies can react with lightning speed in tailoring their "product" mix to changes in the marketplace.

A recurring revenue stream from a firm's customer also helps smooth the financial peaks and valleys that investors disdain, Hale said.

Even the venture capitalists are taking notice. One of them, Bruce Anderson of New York-based Welsh Carson Anderson and Stowe, likens today's independent service providers to the Automatic Data Processing, Inc. of 25 years ago. ADP was a small outfit offering a service, payroll processing, that it felt the market needed.

Growth flows from industry trend

In maintenance, analogous opportunities are seemingly endless. John Harnett, who is responsible for identifying such opportunities for third-party maintenance market co-leader TRW, Inc., points out that all of the market growth flows from one basic industry trend.

Harnett noted that in the sand-to-silicon days when the hardware vendors built their whole systems themselves, they also kept total control over the service base. But as both indirect sales channels and independent service have emerged, Harnett said there has been a "decoupling" of the hardware from the manufacturer.

"There is now a steady stream of customers looking for alternatives to traditional maintenance sources," he said.

So the good news for independent service providers is that the market is bigger and more lucrative than ever. Edward Adams of Mtech, the DP and maintenance services subsidiary of Dallas bank Mcorp, is living proof of the latter. He informed shocked (or envious) conference attendees with the disclosure that his $6 million banking equipment service unit earns operating margins of 27% with prices 20% below IBM list prices.

The not-so-good news, inextricably linked to the good, is that the business is also more competitive than ever. With computer purchasing slowed, the major systems vendors have been increasingly looking to maintain machines built by others — while jealously guarding their own service revenue. This leads to many of those vendors playing hardball on providing parts, documentation and other necessary elements to the independents.

IBM, of course, behaves admirably in that regard, thanks to the 1956 Consent Decree requiring it to treat service firms in much the same way it does IBM customers.

One IBM employee at the Frost & Sullivan conference insisted that even if the decree were lifted, IBM would still maintain its open-door parts policy.

That very well may be so. But just imagine where the third-party maintenance business would be now if no such decree existed in the first place.

Fledgling firm's novel approach

From page 90

tion language called PC Focus from Information Builders, Inc., but ran into difficulties.

"Cheyenne accomplished in six months what had previously taken several man-years and the product — Organization Rx — is 10 times better," says John McCabe, director of marketing at Chemical Bank Information Products.

McCabe says he tapped Cheyenne because the firm's business philosophy fits with Chemical Bank's needs.

"Joint ventures are important to us," he says. "This way we don't have to put a quarter of a million dollars on the table to develop something."

Chemical, which is enlisting the aid of third-party distributors to market Organizational Rx, says it will sell at least a dozen packages this year. The bank envisions a 50% return on its investment in working with Cheyenne, a rate which outstrips the norm.

"And what's better is that we're beating the curve, which says it takes three years to plan and implement new technology. We're doing it in under a year," McCabe says.

McCabe, who calls Cheyenne "my development arm," has contracted with the firm to develop two additional packages: a diagnostic program for personal computers and a collection management system.

Oxenhorn says Cheyenne is encouraged by the response it has received from larger corporations. "For some of these older, larger companies, success creates problems," he says. "It's a never ending battle to keep up."

Although Cheyenne's revenue to date has been negligible, consisting of little more than interest income, Oxenhorn is confident the firm will eventually sign enough marketing partners to penetrate the market. The firm is also considering licensing its applications engine, although Oxenhorn declines to say if or when that might occur.

"We're not looking for a larger percentage of the market; we couldn't handle it anyway," Oxenhorn says. "With our approach, it's not a question of whether we'll be successful, it's a question of when."

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V

OEM pact with IBM aids Hogan Systems' financial rebound

Banking software firm posts quarterly profit

By Mitch Betts

BALTIMORE — Hogan Systems, Inc., a Dallas-based vendor of banking software that posted losses the last two years, appears to be on the rebound after completing a landmark OEM deal with IBM and a corporate shake-up.

Analysts at Alex Brown & Sons, Inc. predicted that "healthy revenue growth, coupled with a sharp rebound in earnings, should drive the stock to higher levels." Last week, Hogan reported second-quarter profits of $1.9 million, or 14 cents per share, compared with a year-earlier loss of $443,000, or three cents per share. That marked the firm's second consecutive profitable quarter.

At a recent investment seminar held by Alex Brown & Sons, much of the attention focused on the IBM agreement announced last May [CW, May 12 and 19]. Under the deal, IBM obtained exclusive U.S. marketing rights to Hogan software for five years, with options for renewal, and nonexclusive rights for 20 years.

Consequently, Hogan's banking software will be sold as the Integrated Banking Applications product in IBM's new Solutionpac software family announced earlier this month [CW, Oct. 6].

For Hogan, the deal dramatically increases the potential distribution of its software by taking advantage of IBM's large, nationwide marketing staff and industry clout. Financially, industry analysts estimated that Hogan gets a 40% to 50% royalty from IBM on each sale, with a guaranteed minimum payment of $750,000 to $1 million a month.

"The IBM agreement has given us a financial foundation to do other things," said Richard B. Aldridge, Hogan's executive vice-president, referring to the prospect of developing new products for financial markets. Aldridge also did not rule out mergers or acquisitions.

Even with new products, however, Hogan will have close ties to IBM. "We won't be developing products that don't have a good chance of being sold by IBM," which will have the first rights to market Hogan's new products, Aldridge said.

But Aldridge denied that Hogan will lose its identity in the marketplace because of the OEM agreement with IBM. "Nothing in the IBM agreement precludes us from selling with a direct sales force into parallel markets," he added.

Image problem

Hogan's image took a beating in 1984 and 1985, when it failed to offer clients any help in implementing its complex banking software and released a faulty loan application package, Aldridge said. He attributed the mistakes to Hogan's rapid growth, fueled by the banking industry's buying spree and management's desire to boost market share.

This strategy neglected customer service, Aldridge said, so Hogan built a customer services unit for supporting the entire software implementation cycle to regain customer confidence. The firm also replaced its technology-oriented management team with a professional management team to run the maturing company, according to Aldridge, who joined Hogan in 1984.

The latest report by Alex Brown & Sons said Hogan's profitability and prospects for long-term growth have been restored. Second-quarter revenue announced last week was $4 million, up from $3 million a year earlier. For the first six months, revenue was $8.8 million, more than double the $4.3 million reported for the first six months a year ago.

Ashton-Tate exec resigns

By Douglas Garney

TORRANCE, Calif. — Ashton-Tate recently announced the resignation of Ronald S. Posner, executive vice-president and general manager of the Systems, Service and Information Division.

Ashton-Tate MIS Director Richard DiGiovanni will serve as acting general manager of the division.

After joining Ashton-Tate in April 1984, Posner spearheaded the division's move into selling service and support programs directly to end-user corporations, a move that generated controversy among some users.

Posner was also involved in developing plans to market information to end users. In addition, Posner served as acting vice-president for Ashton-Tate's international operations.

According to Ashton-Tate Chairman Edward M. Esber Jr., Posner prefers small firms to large firms. After taking a six- to nine-month break from the industry, Posner will most likely pursue entrepreneurial interests, Esber said.

The resignation is effective Oct. 27, and Posner will maintain an advisory role at Ashton-Tate for several months.



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T-1 Open Systems Integration (OSI)—A Technical and Strategic Review

Leader: Harold C. Folts, Executive Director, OMNICOM, Inc.

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T-2 ISDN—Status and Developments

Leaders: James G. Herman, Director, and Mary A. Johnston, Senior Consultant, Telecommunications Consulting Group, BBN Communications

In this tutorial you'll learn what ISDN will and won't deliver in the late 1980s, what the emerging ISDN standards will mean for new services and improved network performance, what holes still exist in the standards and trials, how to make smart buying decisions while keeping open your options for ISDN compatibility, and more. *Level:* Intermediate.

T-3 Strategic Planning for Corporate Information Networks

Leader: Dr. Howard Frank, Howard Frank Associates

Attend this tutorial to learn how to relate vendor offerings and technological trends to your organization's needs and requirements, and to develop a framework to plan future services and systems. You'll examine current issues in network integration, why communication departments must function as "mini telcos," and the pros and cons of software defined networks and private dedicated networks. *Level:* Introductory–Intermediate.

T-4 Planning and Designing Networks with the New Technology

Leader: Dr. John M. McQuillan, President, McQuillan Consulting

In this intensive seminar, you'll get acquainted with the key architectural principles used by today's leading network planners. You'll review emerging technologies such as T-1 networks, hybrids, VSATs, gateways between SNA, LANs and X.25, micro-mainframe links, intercompany networks, and more. *Level:* Advanced.

T-5 Building the Network Management and Technical Control Facility

Leader: Gabriel Kasperek, President, Kazcom, Inc.

This one-day course will help you understand the strategic value of network control, explore alternative technologies for managing your network, and discover how to evaluate current technologies for use in your own organization. You'll become familiar with the test equipment you need for successful network control and understand industry trends and future directions. *Level:* Introductory–Intermediate.

T-6 Designing Voice and Data Networks under the New Tariffs

Leader: Robert L. Ellis, President, The ARIES Group Inc.

Take this tutorial to learn the structure of the post-divestiture tariffs, the latest January 1987 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics involved in configuring data networks, the LATA-pure strategy, and more. *Level:* Intermediate.

T-7 Managing the Telecommunications Resource

Leader: Gerald P. Ryan, President and Founder, Connections Telecommunications Inc.

This one-day course briefs you on how to develop a successful management environment. You'll learn what tools are available to do your job more professionally, how to plan a network management center, how to staff and train the department, and how to prepare and substantiate departmental budgets. *Level:* Intermediate.

T-8 IBM Token-Ring Versus Other LAN Choices

Leader: Dr. Kenneth J. Thurber, President, Architecture Technology Corp.

This tutorial gives you an across-the-board overview of announced products, future plans, compatible products, and IBM's overall strategy with respect to Token-Ring technology. You'll discuss the Token-Ring's relationship to IEEE 802.5 and get an in-depth look at NETBIOS and APPC/LU 6.2 interfaces, and more. *Level:* Intermediate.

T-9 VSAT Technology and Implementation

Leader: Dr. Jerome G. Lucas, President, TeleStrategies Inc.

Learn the basics of applying very small aperture terminal (VSAT) satellite communications to your networking needs. You'll get acquainted with basic application requirements in SNA networking, data broadcasting, PC networking, video broadcasting, and teleconferencing. *Level:* Intermediate.

T-10 IBM's Systems Network Architecture (SNA): A Detailed Road Map

Leader: Daniel Zatyko, President, Zatyko Associates

Enroll in this intensive one-day tutorial to understand the evolution of SNA, and learn fundamental SNA concepts, the seven SNA architectural layers, SNA's physical and logical addressing, strategic SNA products, components of NetView, Token-Ring networks, functionality and capabilities of the LU 6.2/APPC and NETBIOS interfaces, and more. *Level:* Intermediate.

T-11 An Introduction to Data Communications Today

Leader: Gary Audin, President, Delphi Inc.

This course introduces you to the basic concepts, terminology and technology of data communications. You'll learn how various networks operate and how to select them; how best to interconnect computers, terminals, and PCs using different protocols; and what software is necessary to support protocols and network management. *Level:* Introductory.

T-12 Understanding the Communications Regulatory Environment

Leader: Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding

Enroll in this tutorial to learn how telecommunications policy is made and changed, what agencies are active in policy making, how industry segments are affected by current policies, what key issues are now under consideration, and how you can influence future decisions. *Level:* Introductory.

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Digital Research tightens belt with layoffs, reorganization

Realigns business units, product lines

By Peggy Watt

MONTEREY, Calif. — Digital Research, Inc., home of the pioneer CP/M operating system, recently trimmed personnel by up to 30% and realigned its business into three separate units.

Employees not absorbed into the specific duties of the three business units were dismissed, dropping Digital Research's North American personnel to about 140 employees.

Each new business unit will develop, manufacture and market its own product lines. The Flexible Automation business unit will handle Concurrent DOS, and the Graphics unit will handle the Graphics Environment Manager (GEM), as well as GEM applications, according to Digital Research President and CEO John Rowley.

Interconnexions, a wholly owned Digital Research subsidiary formed earlier this month, will also operate autonomously and focus on micro-to-mainframe products.

"We tried to get serious about where the company's making money," Rowley said. "Interconnexions was a self-contained company with only base services from the parent companies. We elected to move to business units to improve the focus on those areas providing revenues," he said.

Operations unaffected

Digital Research's Japan and UK operations, which produce about half of the company's revenue, are largely self-sufficient and unaffected by the action, Rowley said. They employ a total of approximately 100 people.

Digital Research's European marketing recently received a boost when Amstrad Ltd., which produces IBM Personal Computer compatibles, opted to include GEM on its newest model this fall.

Digital Research ran into an early roadblock on the trail with GEM when Apple Computer, Inc. threatened to sue the company for too closely imitating the appearance and outward characteristics of its Macintosh interface.

Digital Research redesigned GEM to avoid pursuing a court battle.

5¢ 10¢ NICKELS AND DIMES

Iomega Corp. reported net income of $1.3 million, or 8 cents per share, on revenue of $31.2 million for the third quarter ended Sept. 28. This compares with net income of $4.1 million, or 27 cents per share, on revenue of $31.1 million in the comparable period a year ago.

■

Seagate Technology Corp. announced revenue for the first quarter ended Sept. 30 of $189 million, a 109% increase over the $99.3 million reported in the like quarter a year ago. Profits were $24.5 million, or 50 cents per share, compared with $1.7 million, or 4 cents per share, a year ago.

■

Nashua Corp. reported revenue for the third quarter ended Sept. 26 of $174 million, compared with $151 million in the previous year. Profits were $4.9 million, or 51 cents per share, compared with $2.9 million, or 31 cents per share, in the like period a year ago.

■

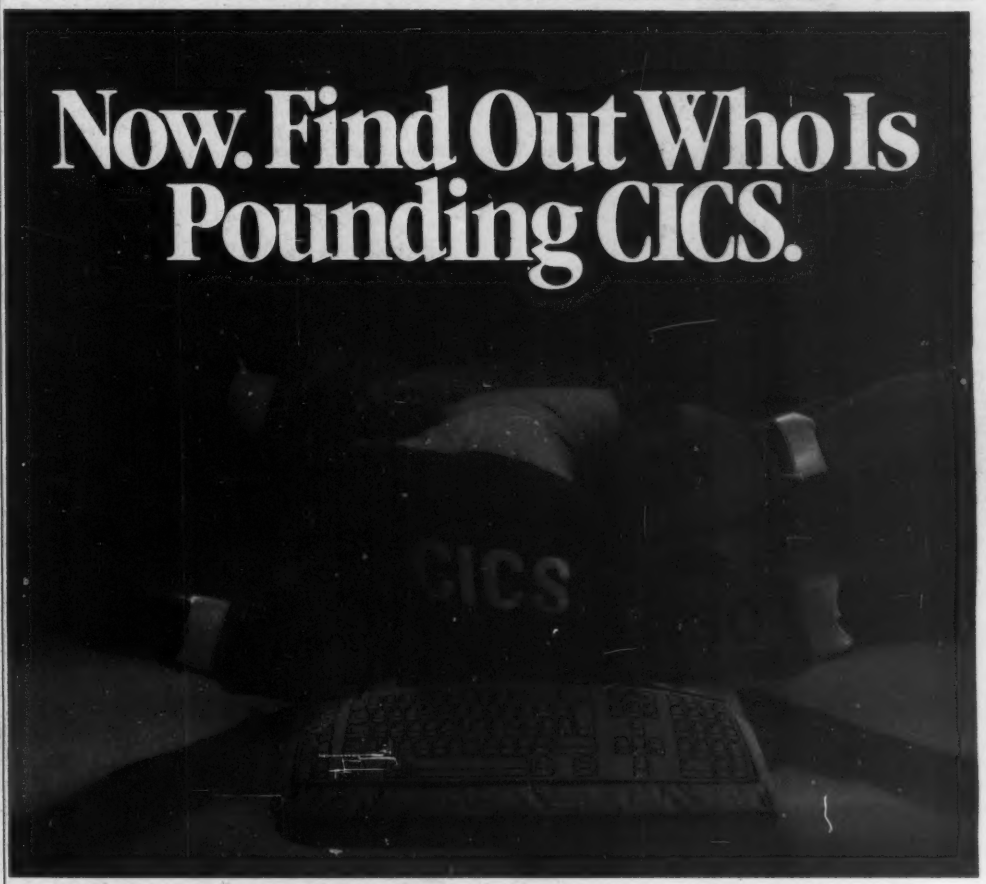
LSI Logic Corp. announced revenue for the third quarter ended Sept. 28 of $46.5 million, up 35% from $34.5 million in the comparable period a year ago. The company reported a net loss of $1.3 million, or 3 cents per share, compared with net income of $2.6 million, or 7 cents per share, one year ago.

■

Corvus Systems, Inc. announced revenue for the first quarter ended Aug. 31 of

See NICKELS page 99

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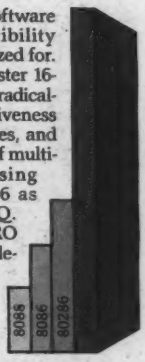
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Micropro strengthens Wordstar, adds clone maker to fold

New president Williams purchases Newstar and promises update in '87

By Peggy Watt

SAN RAFAEL, Calif. — Micropro International Corp., with a new president at the helm, recently bolstered its flagship product, Wordstar, by buying a clone maker and promising an update that is a combination of the clone and new development.

Wordstar Release 4.0 will be out in the first half of 1987, according to Leon Williams, who succeeded Glen Haney as Micropro's president in mid-September.

"Wordstar is still 50% of our sales," Williams said. "There's a very long life to Wordstar. We need to serve those users."

Added technology

Much of the technology for the new release will come from the work of Newstar Software, Inc. of Pleasant Hill, Calif., which Micropro acquired recently. Its products include New Word, a Wordstar look-alike for IBM Personal Computer and compatible systems and New Word 2, a Wordstar clone for CP/M systems.

Those products will ship until Micropro releases a Wordstar upgrade, Williams said. He added that Micropro may update the CP/M version of Wordstar with Newstar's help.

Three Newstar employees will move to Micropro, including Stanley Reynolds, president; Peter Mierau, vice-president of product development; and Walter Feigenson, vice-president of marketing and sales.

Though Micropro said the purpose of the acquisition was to obtain continuing technology to bolster and develop its product line, industry observers questioned the stability of a move, while applauding the intent.

"Whatever they do, they still seem to have heavy sales of the old Wordstar," said Jeff Tarter, editor of "Softletter," a newsletter based in Cambridge, Mass. "But if they have to acquire another company to get the technology to enhance their basic product, that's discouraging." However, Tarter said, if Micropro maintains file compatibility among versions, Wordstar's loyal users will very likely appreciate upgraded features.

Cheryl Creager, an editor at Boston-based Addision-Wesley Publishing Co., said she uses files on Wordstar at work and New Word at home without complications.

Unique protection

None of Micropro's products are copy protected, but Newstar products have a unique kind of protection. Upon opening the package, the user must call the company to register the product and receive a password that will activate it.

"We couldn't handle that kind of stampede," Williams said of the Newstar system. He said he has no plans to copy-protect Micropro products but is exploring other options to encourage registration.

Renewed contact with nearly a million Wordstar users may also bring fiscal benefits to the company, which recently posted close to a $1 million loss for the year.

However, a $1.4 million loss was attributed to the loss of inventory that was held by distributor First Software Corp., which filed for bankruptcy.

NICKELS from page 95

$12.4 million, compared with $11.9 million in the previous year. The company reported a net loss of $3.9 million, or 13 cents per share, compared with a net loss of $931,000, or 3 cents per share, in the comparable period a year ago.

■

Maxtor Corp. announced revenue for the second quarter ended Sept. 28 of $39.7 million, a 112% increase over revenue of $18.7 million for the like quarter last year. Profits were $6.1 million, or 32 cents per share, compared with $18.7 million, or 17 cents per share, in the same period a year ago.

■

Dataproducts Corp. announced revenue of $84.5 million and net income of $2.7 million, or 13 cents per share, for the quarter ended Sept. 27.

This compares with revenue of $79.9 million, and a net loss of $13.9 million, or 67 cents per share, that was reported for the like period a year ago.

■

Computer Automation, Inc. announced revenue for the quarter ended Sept. 30 of $5.3 million, compared with $4.9 million in the previous year.

Profits were $288,000, or 14 cents per share, compared with a net loss of $3.6 million, or $1.74 per share, in the like period a year ago.

■

Integrated Software Systems Corp. reported revenue for the third quarter ended Sept. 30 of $11.8 million, compared with $11.2 million one year ago.

Profits were $563,000, or 10 cents per share, compared with $1.4 million, or 25 cents per share, in the like quarter a year ago.

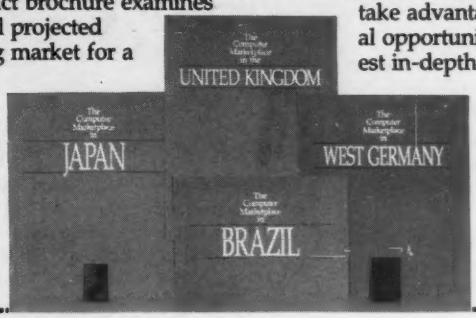
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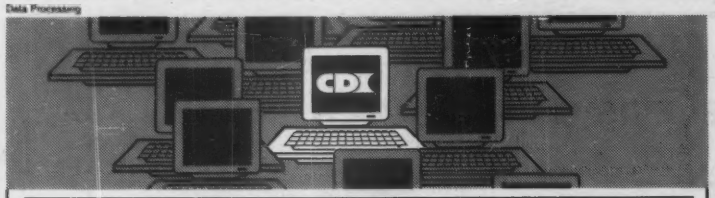
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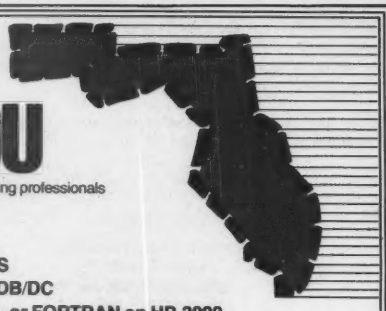
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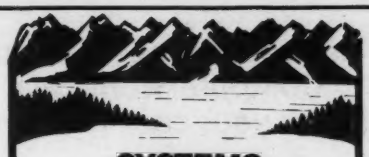
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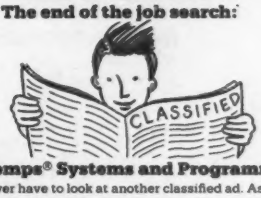
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IBM scraps policy, announces sale of South African firm

Users anticipated sale, switch to other suppliers

By Stanley Gibson

Scrapping a long-standing corporate policy, IBM joined a growing trend among large U.S. corporations last week by announcing it will sell its South African subsidiary.

IBM's announcement came on the heels of U.S. Congress's passage of a bill limiting South African trade and one day after General Motors Corp. said it will sell its South African operations. Both companies were formerly opposed to divestiture and had been strong advocates of corporate involvement as a force for social change in South Africa. IBM South Africa Ltd. generates less than 1% of IBM's worldwide revenues.

Cees Roon, President of Computer Users Council of South Africa, based near Johannesburg, criticized IBM's move, although he said users were expecting it.

"Our users have been anticipating it for some time," he said. Users have been moving to other suppliers like Sperry Corp; Burroughs Corp; Fujitsu Ltd.; Hitachi Ltd.; International Computers Ltd., a British concern; and German suppliers, resulting in a slowdown of IBM sales during the past couple of years, according to Roon.

However, he pointed out that under the IBM withdrawal agreement, South African users will be able to obtain IBM equipment for at least three years. "Will the withdrawal of U.S. companies do any good? The answer is no. It will lead to more violence," Roon claimed.

IBM will sell the subsidiary to a new company, which will fulfill IBM's contractual responsibilities, selling products, parts and services from IBM, and may represent other suppliers as well. Jack Clarke, currently the general manager of IBM South Africa, will head the new company. Last year, Clarke publicly called for an end to apartheid.

Of IBM South Africa's nearly 1,500 employees, 15% are black and another 8% are nonwhite and Asian. Some owners of the new firm will be blacks, an IBM spokesman said.

> ***'By taking this step now, we can best carry out our responsibilities to our employees and our customers in South Africa.'***
>
> — John F. Akers
> IBM

Details of plans for the sale are not yet complete, but a spokesman said a trust for the benefit of the subsidiary's employees will be established, and the trust will purchase the subsidiary. The sale will be completed by March 1, 1987.

"Unfortunately, the deteriorating political and economic situation in South Africa and between South Africa and its trading partners makes our action necessary. By taking this step now, before our freedom of action is further limited, we can best carry out our responsibilities to our employees and our customers in South Africa," IBM Chairman John F. Akers said in a formal statement.

A year ago, Akers wrote in *The New York Times*, "We believe the right thing to do is to remain and to redouble our efforts to advance social equality. Pressure on apartheid will be increased by more corporate involvement, not less."

In 1984, only seven U.S. firms left South Africa. But in 1985, the total rose to 39. So far in 1986, 22 companies have sold their interests and another eight have said they will do so, according to the Investor Responsibility Research Center in Washington, D.C.

The industry giant's policy reversal set off speculation that other computer makers would follow suit.

Honeywell, Inc. said it is negotiating to sell its South African operations, which do not include sale and service of computers. "No final action has been taken," a company spokesman said in a statement.

A Burroughs spokesman said, "Our goal remains being a positive force in the ending of apartheid. We believe our continuing presence there serves that goal, as well as our customers and employees' best interest, and we will continue to monitor the situation."

Hewlett-Packard Co. continues to operate a wholly owned sales subsidiary in Johannesburg, which employs 260 persons and had revenue of $44 million last year. "We intend to remain in South Africa," a company spokesman said.

A Control Data Corp. spokesman also said his firm will continue its sales and service operation in Johannesburg, "as long as we can contribute to meaningful change." The subsidiary, which employs 194 people, sells educational products and services and Cyber mainframes.

Both Digital Equipment Corp. and Wang Laboratories, Inc. had discontinued South African ties several years ago, spokesmen said. Data General Corp. has never had operations there.

Industry insiders in South Africa said the IBM decision will have little impact on the country's computer industry. "Any smart reader can understand that the IBM withdrawal is a formal one," said an official at one European firm with a South African subsidiary. "They will continue selling computers. From a substantive point of view, it doesn't change much."

Adrian Louw, managing director of Fujitsu agent Lasernet, said his Johannesburg-based company is ready to fill any gap IBM's shift might open. "The computer market in South Africa is very dynamic," he said. Louw estimated South African computer sales to be about $1 billion a year, most of which is imported.

U.S. State Department spokesman Charles Redman offered support for those companies that remain.

"We regret any decision to reduce U.S. private sector involvement in South Africa. We have long maintained that U.S. corporate involvement in South Africa has served as a progressive force in the overall anti-apartheid movement."

However, some apartheid opponents said the IBM move, while welcome, was not strong enough.

"We are dissatisfied with the way in which IBM plans to leave South Africa in that the new company will continue to supply their products, parts and service. However, we think that IBM's move is an important political signal," offered Cecelie Counts, Southern African Coordinator for Transafrica, Inc., a black-American lobbying group in Washington, D.C.

Prime, Wang both sluggish

From page 118

significant new customers for its fault-tolerant systems helped Stratus tally third-quarter profits of $3.4 million, or 18 cents a share, up 55% from the like period last year. Revenue was $32.1 million, an increase of 52% from the year-earlier period.

William E. Foster, president of the Marlboro, Mass.-based firm, said new contracts with the American Stock Exchange and New York Stock Exchange and a volume purchase agreement with Visa U.S.A., Inc. helped the firm meets its financial performance goals.

• **Cray Research, Inc.** Minneapolis supercomputer maker Cray reported third-quarter profits of $26.1 million, or 83 cents a share, on revenue of $136 million. In the like period last year, the firm reported a net profit of $19 million, or 63 cents a share, on revenue that totaled $99.4 million.

The company installed six new computers during the third quarter, all of them purchased.

"We now expect to install 36 new computer systems during 1986, including five leased systems and one for our own use, compared to a total of 28 systems installed last year," noted John Rollwagen, chairman and chief executive officer.

• **Computer Consoles, Inc.** (CCI). After almost two years in the red, Computer Consoles reported its first profit since the fourth quarter of 1984. The firm posted third-quarter net earnings of $1.6 million, or 13 cents a share, compared with a $4.2 million net loss in the comparable period last year. Revenue was up 34% to $34 million in the period.

CCI Chairman and Chief Executive Officer John F. Cunningham said the results were boosted by a significant reduction in operating expenses and a $25 million add-on order of a directory assistance system for British Telecommunications PLC.

• **Computervision Corp.** The Bedford, Mass.-based computer-aided design and manufacturing firm also returned to profitability, posting earnings of $1.2 million, or 4 cents per share, on a 19% revenue gain to $125.9 million.

A year ago, Computervision posted a loss from operations of $11.6 million, or 40 cents per share.

• **Harris Corp.** The systems, communications and semiconductor firm reported a 26% rise in profits, to $16.3 million, or 40 cents per share. Because of the Jan. 1, 1986, spin-off of the Lanier image processing unit into a joint venture with 3M Corp., Harris's sales of $469.4 million were 16% below year-earlier levels.

• **Computer Associates International, Inc.** Increased demand for Computer Associates' entire software product line sparked a second-quarter net profit increase of 105% to $6.5 million, or 26 cents a share. Revenue increased 51% to $63.5 million over the like period last year.

• **Microsoft Corp.** Continuing its rapid expansion, Microsoft posted a fiscal first-quarter net profit of $15.8 million, or 57 cents a share, up 156% from the year-earlier level. Sales soared 90% during the period to $66.7 million, edging Microsoft past Lotus Development Corp. for the first time as the world's largest independent microcomputer software house in terms of revenue. Lotus had earlier reported a 32% revenue increase to $65.6 million.

Microsoft's international revenue totaled $27.3 million, or 41% of the Redmond, Wash., firm's total revenue. Microsoft's existing products continued to gain market position, President and Chief Operating Officer Jon Shirley said.

• **Software Publishing Corp.** Fueled by sales of new products to both new and existing customers, Software Publishing recorded a 28% increase in fourth-quarter revenue to $6.4 million. Net earnings were $454,000, or 6 cents a share, compared with a net loss of $737,000 in the like period last year.

• **Storage Technology Corp.** With its emergence from Chapter 11 protection edging closer, Storage Technology reported third-quarter earnings of $9 million, or 26 cents a share, compared with a $14 million loss in the year-earlier period. Revenue during the period was up 4% to $178 million.

• **Ungermann-Bass, Inc.** The Santa Clara, Calif.-based supplier of local-area networks posted net earnings of $1.2 million, or 7 cents a share, in the third quarter, off slightly from the like period last year. Revenue, however, was up 56.5% to $29.8 million, the firm said.

• **AST Research, Inc.** Hurt by cost competition and falling margins in its market, the Irvine, Calif., micro enhancement vendor continued its recent sluggish performance. Profits tumbled from year-earlier levels of $8.1 million, or 70 cents per share, to $3.1 million, or 27 cents per share. Revenue dropped 8% to $40.2 million.

Computerworld *Senior Editor Clinton Wilder contributed to this story.*

On-Line gets sales channel

As expected, **On-Line Software International, Inc.** of Fort Lee, N.J., has agreed to acquire the Ramis II, UFO, Consensus and Unison software products from **Martin Marietta Data Systems, Inc.** for $35 million. The acquisition [CW, Oct. 6] is scheduled to be completed by the end of this week.

The products represent Martin Marietta's packaged software business, located in Princeton, N.J., and include the former Mathematica Products Group, Inc. and Oxford Software Corp. companies. The acquisition includes the sales force selling the products, giving On-Line, currently a telemarketing firm, a direct sales channel for the first time. Martin Marietta will retain its manufacturing, financial and human resource applications packages and its Orlando, Fla., data center computing services.

■

IBM's Federal Systems Division recently won a seven-year contract to provide the **U.S. Social Security Administration** with 33,000 terminals, communications controllers and printers for its 1,300 U.S. offices. The contract is valued at $40.4 million for the first year for hardware and installation, with maintenance and additional purchase revenue for the following six years to be determined.

■

Struggling **Daisy Systems Corp.** suffered another setback last week when it pleaded guilty to tax evasion in Massachusetts state court. The Massachusetts Department of Revenue said the $50,000 fine against the Mountain View, Calif., workstation vendor was the largest ever levied for tax evasion in the state. Daisy admitted it failed to report and pay taxes on $2.3 million in sales in Massachusetts between 1982 and 1985.

INDUSTRY NOTES

■

Cipher Data Products, Inc. announced it will shift production of ½-in. reel-to-reel tape drives to Singapore and close its Garden Grove, Calif., manufacturing plant, which employs 750 people. Cipher Data said it will try to place some of the dismissed employees at other low-volume plants in San Diego. Cipher Data previously shifted production of its ¼-in. cartridge tape drives to Singapore.

Reassessing investments to avoid that sinking feeling

ACTIVE ISSUES
Kathy Porteus

This week marks the 57th anniversary of the infamous stock market crash when the Dow Jones Industrial Average plunged 12.8% in one trading session. Although none of the dramatic single-day percentage declines of 1986 approach that of Oct. 29, 1929, many individuals feel queasy about the market's increasingly large fluctuations.

Obviously, individuals cannot control the dynamics of the market nor the impact that stock index futures have on stock market volatility. However, investors can control their impulse to panic. While it is no longer a matter of avoiding open windows, investors must learn how to reassess a situation that has turned against them.

"You should always focus on the fundamentals of companies you hold," says Bruce Everitt, president of Nova Advisors in Boston. A company's fundamentals include competitive, industry and financial data. "If your portfolio drops 4% to 5% along with the market," Everitt says, "but you are convinced that the fundamentals of your holdings are good, then you are much better off riding through a period like this."

If nothing has changed in a company's fundamentals, Everitt suggests investors consider purchasing additional shares to take advantage of lower prices.

In reassessing investments, one should also consider the current market's short-term orientation and unforgiving mood. Everitt cites KLA Instruments Corp. as an example of a stock that recently dropped 22% because its orders in the last quarter were down slightly, yet the company's outlook remained strong.

"During a period like this," Everitt notes, "you can like a company, but if it disappoints near term, don't hold it." On the other hand, when the price of a stock such as KLA Instruments levels off, one might reassess the situation and buy back in.

According to Kenneth L. Fisher, money manager and *Forbes* columnist, the basic question one should have asked after Hewlett-Packard Co. announced postponing delivery of its Spectrum was not so much, "Do I still believe in HP's Spectrum strategy?" as it was, "Can I get more for my investment elsewhere?" Fisher says that unless a company achieves exceptional earnings growth, one should wonder about the payoff of a stock that sells at 20 times its earnings.

Fisher suggests using this stock market decline as a buying opportunity. "You can be relatively comfortable if a stock is currently unpopular, sells at a low price/sales ratio, exhibits a strong product position and financial balance sheet and shows signs that management has learned from whatever mistakes might have been made," he says.

As an example, Fisher cites System Industries, Inc., which addresses the add-on peripheral systems market. According to Fisher, System Industries has a new team of seasoned managers, is expanding its presence in the add-on market for Digital Equipment Corp. computers and sells at six times current earnings.

According to Derick Driemeyer, investment strategist with A. G. Edwards, individuals can better reassess a situation gone awry if they limit downside risk by defining, at the time of purchase, how much they are willing to lose or by lightening their position once a satisfactory gain has been achieved. Such decisions made early and calmly will help individuals when the temptation to panic arises.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

IBM leans on industry partners

From page 118

come to us when you have ideas or are just starting out. It's a ridiculous waste of our time and yours."

IBM plans to improve its applications programming by taking advantage of existing code, Berland said. "Applications are being built from scratch, and it's too costly," he said. "The fact is that we aren't going to write all that code."

Software, Berland said, is the key to all customer solutions. But customers are drowning in technology. "There is more technology out there today than our customers can contend with," Berland observed, explaining that vendors must help users assimilate technology.

End users only want their systems to be easy to learn, Berland said, adding that he refused to attend classes or read a manual to learn how to use the system in his office. Rather, he insisted someone show him within 30 minutes how to use his computer. "I don't think I'm so different from other users," he said.

As systems become more complex, the intricacies must be made transparent to users, Berland said. "The fact is the end user doesn't want to see or know any of that," he said. "No end user gives a damn about the fruit salad of initials." He suggested that operating system acronyms should be purged from sales pitches.

Artificial intelligence applications will only be useful commercially if they can access traditional data bases, he said. "I'm here to tell you AI has tremendous potential but not as it is being proselytized now," Berland noted. "If it's true you need a Ph.D. in AI and five years' experience with it, it will fail."

Televideo nixes Alpha Micro buy

From page 118

In its last fiscal year ended Feb. 23, Alpha Micro lost $3.5 million on revenue of $48.2 million, but analysts expect the company to break even in the current quarter ending in November.

Cortese expressed disappointment that the offer was withdrawn but said that business is improving and Alpha Micro will show a profit in the current quarter. A primary reason, he said, is that the company's new high-end AM-1500 and AM-2000 systems are selling well and bringing in more money because of their higher prices.

In the meantime, Alpha Micro should be on good footing with more than $2 million in cash, no long-term debt and the improved operating performance, Cortese said.

Armed with some $68 million in cash reserves, Televideo will continue its search for other merger candidates, Mistlin said. Howard Oringer, formerly chief operating officer and executive vice-president at Televideo, has been named executive vice-president in charge of acquisitions and strategy for the company.

CORRECTION

IBM's worldwide installed base of DOS is approximately 22,000 licensees. The figure appeared incorrectly in Bob Djurdjevic's Oct. 20 Industry Insight column.

CDC goes down fighting

From page 116

contracts. He warned that the contract could set a dangerous precedent with government systems contracts that may allow Japanese systems companies to grab business from U.S. companies, much like the semiconductor companies did.

"When you have the government buying straightforward Japanese computers, then it's just a matter of time until they've eased out the U.S. computer companies," Jones said.

If CDC does lodge an official protest, it will be through the General Accounting Office, according to Jones.

"The benchmark requirements were not lowered," an Air Force public affairs spokeswoman in Washington said. CDC has "neglected to understand that the Trade Agreement Act identifies approximately 50 countries which are exempt from the Buy American Act. One of those countries is Japan," she said.

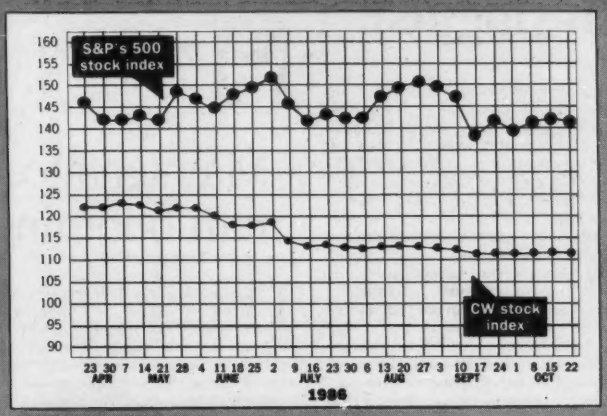
Separately, CDC reported a third-quarter loss of $9.3 million — its seventh consecutive quarter in the red. Although some analysts expected CDC to return to profitability, the loss represented a drastic improvement over a loss of $255.6 million in the year-earlier quarter.

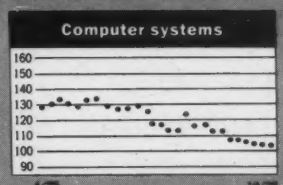
Revenue for CDC's retrenched computer business fell 8.5% from year-earlier levels to $818.5 million. The profits of CDC's Commercial Credit Co. subsidiary fell 17% to $10 million.

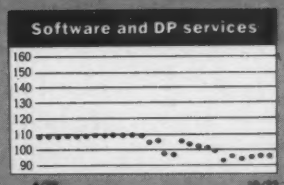
COMPUTER INDUSTRY

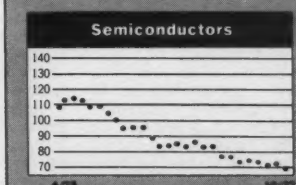
MITCHELL J. HAYES

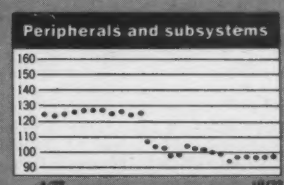
Computerworld stock trading index



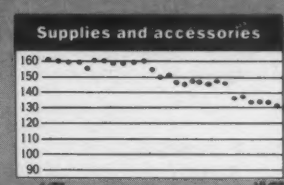












All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

	10/15/86	10/22/86
Computer systems	105.5	**103.4**
Software and DP services	96.4	**98.4**
Peripherals and subsystems	97.2	**97.9**
Supplies and accessories	131.3	**130.2**
Semiconductors	71.2	**69.7**
Leasing companies	96.1	**97.5**
CW stock index	111.4	**111.3**
Standard and Poor's 500 stock index	142.8	**141.3**

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, OCTOBER 22, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)		CLOSE OCT 22 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	8	4	5.25	-1.5	-22.2
O	ALTOS COMPUTER SYS	19	10	10.25	-0.3	-2.4
A	AMDAHL CORP	22	10	19.63	+0.4	+1.9
O	APOLLO COMPUTER INC	18	9	13.00	-0.6	-4.6
O	APPLE COMPUTER INC	39	18	32.50	-0.9	-2.6
N	AT&T	26	20	23.63	-1.1	-4.5
N	BURROUGHS CORP	76	55	71.38	+2.1	+3.1
O	C P T CORP	7	3	3.38	-0.4	-10.0
N	COMPAQ COMPUTER CORP	18	10	15.50	+0.0	+0.0
A	COMPUTER CONSOLES INC	12	6	8.25	+0.8	+10.0
O	CONCURRENT COMP CORP	25	1	13.50	-1.0	-6.9
N	CONTROL DATA CORP DEL	29	16	25.00	+0.1	+0.5
O	CONVERGENT TECH	14	5	4.75	-0.3	-5.0
N	CRAY RESH INC	100	51	76.25	-1.5	-1.9
O	DAISY SYS CORP	32	8	7.75	-0.3	-3.1
N	DATA GEN CORP	50	26	26.50	-1.4	-4.9
N	DATAPOINT CORP	9	5	8.75	+0.5	+6.1
N	DIGITAL EQUIP CORP	105	55	96.88	+2.9	+3.1
N	ELECTRONIC ASSOC INC	7	4	4.25	+0.0	+0.0
N	FLOATING POINT SYS INC	46	11	10.75	-0.8	-6.5
N	GOULD INC	35	15	19.63	-0.4	-1.9
N	HARRIS CORP DEL	36	24	29.25	+1.3	+4.5
N	HEWLETT PACKARD CO	50	30	37.50	-1.0	-2.6
N	HONEYWELL INC	87	59	67.38	-0.8	-1.1
N	IBM	162	120	120.38	-2.6	-2.1
O	IPL SYS INC	4	1	2.00	-0.3	-11.1
N	ITT CORP	60	33	52.50	+0.4	+0.7
N	M A COM INC	19	13	14.38	+0.0	+0.0
N	MATSUSHITA ELEC INDL LTD	118	56	109.00	+1.0	+0.9
O	MENTOR GRAPHICS CORP	21	11	15.00	+0.5	+3.4
N	MOHAWK DATA SCI CORP	4	1	2.38	-0.3	-9.5
N	NBI INC	14	8	8.50	-0.9	-9.3
N	NCR CORP	57	34	45.00	+1.4	+3.2
N	PRIME COMPUTER INC	28	16	17.50	-0.3	-1.4
N	SPERRY CORP	77	46	75.75	+0.0	+0.0
O	STRATUS COMPUTER	26	17	19.75	+0.5	+2.6
O	SYMBOLICS INC	16	5	5.13	+0.1	+2.5
O	TANDEM COMPUTERS INC	40	16	37.50	+1.0	+2.7
N	TANDY CORP	45	31	37.25	+3.0	+8.8
N	TEXAS INSTRS INC	148	88	108.25	-3.8	-3.3
A	ULTIMATE CORP	25	12	13.75	+0.3	+1.9
A	WANG LABS INC - B	23	11	10.50	-1.5	-12.5
A	WANG LABS INC - C	23	11	10.88	-1.0	-8.4
N	XEROX CORP	72	48	54.25	-1.8	-3.1

SUPPLIES & ACCESSORIES

EXCH		52-WEEK RANGE (1)		CLOSE OCT 22 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMER BUSINESS PRODS	37	25	26.63	-0.4	-1.4
N	BARRY WRIGHT CORP	25	15	15.25	-0.4	-2.4
A	DUPLEX PRODS INC	23	18	19.25	+0.1	+0.7
N	ENNIS BUSINESS FORMS INC	28	19	23.00	+0.0	+0.0
N	3M CO	118	77	105.13	-2.1	-2.0
N	MOORE LTD	28	19	20.88	+0.4	+1.8
O	STANDARD REGISTER CO	50	32	31.50	-1.8	-5.3
N	WALLACE COMPUTER SVCS	50	35	39.38	+0.9	+2.3

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER; S=SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)		CLOSE OCT 22 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	4	4.88	-0.1	-2.5
N	ADVANCED SYS INC	19	12	14.25	+0.5	+3.6
N	AGS COMPUTERS INC	25	15	19.75	+1.4	+7.5
O	AMERICAN MGMT SYS INC	20	10	16.38	+1.4	+9.2
O	AMERICAN SOFTWARE INC	15	9	13.00	-0.1	-1.0
N	ANACOMP INC	7	3	3.38	-0.5	-12.9
O	ANALYSTS INTL CORP	10	4	5.75	+0.1	+2.2
O	ASHTON TATE	36	10	36.38	+5.6	+18.3
O	ASK COMPUTER SYS INC	15	9	11.00	-0.4	-3.3
O	ASTRADYNE COMP IND	3	1	1.94	+0.1	+6.9
N	AUTOMATIC DATA PROC	39	26	36.75	+0.3	+0.7
O	COMPUTER ASSOC INTL INC	25	12	22.75	+0.0	+0.0
O	COMPUTER HORIZONS CORP	15	10	10.38	-0.4	-3.5
D	COMPUTER NETWORK TECH	10	2	4.38	-0.4	-9.1
N	COMPUTER SCIENCES CORP	40	26	35.25	+1.5	+4.4
O	COMPUTER TASK GROUP INC	19	11	12.63	-1.3	-9.0
O	COMPUTONE SYS INC	6	0	0.38	-0.4	-50.0
O	COMSHARE INC	16	9	10.75	-1.0	-8.5
N	CULLINET SOFTWARE INC	20	6	6.50	+0.0	+0.0
O	CYCARE SYS INC	17	9	8.88	-0.3	-2.7
O	DUQUESNE SYS INC	33	13	31.50	+2.0	+6.8
N	GENERAL ELEC CO	83	58	76.25	-0.6	-0.8
N	GENERAL MTRS CORP	50	30	35.50	+1.8	+5.2
N	GTE CORP	60	39	57.13	+0.1	+0.2
O	HOGAN SYS INC	12	6	11.13	+0.3	+2.3
O	INFORMATION SCIENCES INC	4	1	1.63	+0.0	+0.0
O	INFOTRON SYS CORP	19	8	8.75	+0.0	+0.0
O	KEANE INC	16	6	6.00	-0.3	-4.0
N	LOGICON INC	43	24	26.75	-0.3	-0.9
O	LOTUS DEV CORP	49	17	46.00	+2.0	+4.5
O	MANAGEMENT SCI AMER	16	9	12.00	+0.0	+0.0
O	MCI COMM CORP	13	7	7.00	-0.3	-3.4
O	MICOM SYS INC	23	10	12.00	-0.5	-4.0
O	MICRO PRO INTL CORP	4	2	2.13	+0.0	+0.0
O	MICROSOFT CORP	38	26	37.75	+2.8	+7.9
O	NATIONAL DATA CORP	26	14	21.50	+0.3	+1.2
O	ON LINE SOFTWARE INT	16	8	10.00	-0.5	-4.8
O	ORACLE SYS CORP	29	13	17.75	-0.3	-1.4
N	PANSOPHIC SYS INC	36	21	28.75	+0.0	+0.0
N	PLANNING RESH CORP	24	14	20.25	-0.6	-3.0
O	POLICY MGMT SYS CORP	24	15	17.25	-1.0	-5.5
O	PROGRAMMING & SYS INC	11	5	8.50	+0.0	+0.0
O	REYNOLDS & REYNOLDS CO	42	19	34.25	-0.1	-0.4
O	SCIENTIFIC COMPUTERS INC	6	4	4.75	+0.3	+7.0
O	SEI CORP	28	15	20.00	+0.5	+2.6
O	SHARED MED SYS CORP	41	29	35.75	+0.5	+1.4
O	SOFTWARE AG SYSTEMS INC	22	14	14.75	-0.5	-3.3
O	SOFTWARE PUBG CORP	10	5	6.00	+0.6	+11.6
A	STERLING SOFTWARE INC	21	9	14.38	-0.6	-4.2
N	UCCEL CORP	26	13	25.75	+2.6	+11.4
N	URS CORP	18	10	17.00	+1.9	+12.4
O	VM SOFTWARE INC	32	17	30.00	+1.8	+6.2

SEMICONDUCTORS

EXCH		52-WEEK RANGE (1)		CLOSE OCT 22 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	34	13	13.25	-1.5	-10.2
N	ANALOG DEVICES INC	25	15	16.75	+0.4	+2.3
O	ANALOGIC CORP	16	10	10.25	-0.5	-4.7
N	APPLIED MAGNETICS CORP	20	12	13.88	-0.1	-0.9
O	AVANTEK INC	24	15	15.75	+0.3	+1.6
O	HADCO CORP	7	3	3.75	-0.3	-6.3
O	INTEL CORP	32	16	19.25	+0.0	+0.0
O	MICRO MASK INC	7	2	2.88	+0.0	+0.0
N	MOTOROLA INC	50	31	33.88	-1.5	-4.2
N	NATIONAL SEMICONDUCTOR	16	8	9.50	+0.0	+0.0
N	TERADYNE INC	30	16	16.25	-0.1	-0.8

PERIPHERALS & SUBSYSTEMS

EXCH		52-WEEK RANGE (1)		CLOSE OCT 22 1986	WEEK NET CHNGE	WEEK PCT CHNGE
A	AM INTL INC	9	4	5.50	-0.3	-4.3
A	ANDERSON JACOBSON INC	3	2	2.00	+0.1	+3.2
O	AST RESH INC	33	11	11.13	-0.6	-5.3
O	AUTOTROL CORP	10	6	6.88	+0.1	+1.9
O	AVANT GARDE COMPUTING	7	3	4.13	-0.1	-2.9
O	BANCTEC INC	13	8	9.00	+0.6	+7.5
N	BOLT BERANEK & NEWMAN	48	30	41.50	-0.5	-1.2
N	CENTRONICS DATA COMP	8	4	6.88	-0.1	-1.8
A	CETEC CORP	9	5	5.63	+0.1	+2.3
A	COGNITRONICS CORP	6	2	2.50	+0.0	+0.0
N	COMPUGRAPHIC CORP	29	16	19.38	-0.3	-1.3
N	COMPUTERVISION CORP	19	9	14.63	+0.3	+1.7
N	CONRAC CORP	18	12	14.25	+0.0	+0.0
A	DATAPRODUCTS CORP	18	12	13.25	-0.4	-2.8
A	DATARAM CORP	18	6	7.50	-0.4	-4.8
O	DATA SWITCH CORP	9	5	5.63	+0.3	+4.7
O	DATUM INC	7	5	4.75	-0.1	-2.6
N	DECISION INDS CORP	15	8	8.88	-0.4	-4.1
O	ENDATA INC	8	3	6.00	+0.0	+0.0
O	EVANS & SUTHERLAND	27	18	24.25	+1.8	+7.8
N	FLOATING POINT SYS INC	46	11	10.75	-0.8	-6.5
O	GANDALF TECHNOLOGIES	8	5	5.63	-0.3	-4.3
N	GENERAL DATACOMM IND	15	8	8.75	-0.5	-5.4
N	HAZELTINE CORP	27	16	20.25	-1.3	-5.8
O	ICOT CORP	13	7	8.88	-0.4	-4.1
O	INFORMATION INTL INC	18	10	13.75	+0.0	+0.0
O	INTECOM INC	7	3	5.31	+0.0	+0.0
O	INTERLEAF INC	15	8	9.88	+1.4	+16.2
O	MEGADATA CORP	5	2	2.25	+0.0	+0.0
A	MSI DATA CORP	14	8	11.50	-0.8	-6.1
N	NASHUA CORP	28	12	23.25	-0.6	-2.6
O	NETWORK SYS CORP	25	10	11.75	-0.9	-6.9
N	NORTH AMERN PHILIPS CORP	48	33	38.75	-0.1	-0.3
N	NORTHERN TELECOM LTD	38	25	29.25	+0.1	+0.4
O	NOVELL INC	24	13	20.25	+0.8	+3.8
O	OMEX	1	0	0.38	+0.0	+0.0
N	PARADYNE CORP	11	5	5.50	+0.0	+0.0
A	PENRIL CORP	9	5	5.88	+0.1	+2.2
N	PLESSEY PLC	38	19	25.25	-0.8	-2.9
O	PRINTRONIX INC	15	11	12.50	+0.3	+2.0
O	QMS INC	18	6	14.13	+1.1	+8.7
O	RAMTEK CORP	7	3	4.63	+0.0	+0.0
N	RECOGNITION EQUIP INC	17	9	12.38	+0.3	+2.1
N	SANDERS ASSOC INC	63	29	59.88	+0.0	+0.0
O	SCAN TRON CORP	19	10	16.50	+0.5	+3.1
N	SCIENTIFIC ATLANTA INC	15	9	9.63	+0.8	+8.5
O	SEAGATE TECHNOLOGY	18	5	17.50	-0.4	-2.1
N	STORAGE TECHNOLOGY	7	1	2.25	+0.1	+5.9
O	SUN MICROSYSTEM INC	20	11	16.38	+0.8	+4.8
A	T-BAR INC	7	5	6.38	+0.9	+15.9
A	TAB PRODS CO	15	10	13.13	-0.1	-0.9
O	TANDON CORP	8	2	2.25	+0.0	+0.0
A	TEC INC	8	4	4.38	-0.1	-2.8
N	TEKTRONIX INC	65	50	64.00	+1.6	+2.6
O	TELEVIDEO SYS INC	4	2	2.50	+0.0	+0.0
N	TELEX CORP	69	44	60.63	+3.9	+6.8
N	TIMEPLEX INC	24	14	17.50	-1.0	-5.4
N	TITAN CORP	12	6	7.75	+0.8	+10.7
O	VISUAL TECHNOLOGY INC	1	0	0.59	+0.0	-5.0
O	WYSE TECH	19	9	14.88	+1.3	+9.2

LEASING COMPANIES

EXCH		52-WEEK RANGE (1)		CLOSE OCT 22 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	25	12	16.63	+0.6	+3.9
N	CONTINENTAL INFO SYS	12	5	8.75	-0.1	-1.4
O	FINALCO GROUP INC	5	3	3.25	-0.1	-3.7
O	PHOENIX AMERN INC	6	2	4.88	+0.3	+5.4
O	SELECTERM INC	12	5	6.31	+0.2	+3.1
N	U.S. LEASING	46	32	43.13	+0.6	+1.5

COMPUTER INDUSTRY

INSIDE

Cheyenne Software's approach: Leave marketing to large users and VARs/**90**

Hogan's rebound continues as the IBM label on its products is readied/**92**

IBM pulls out of South Africa/**115**

On-Line Software International finalizes the purchase of four products and a direct sales force from Martin Marietta/**116**

INSTANT ANALYSIS

"In a company doing well, management controls the decisions. In a company doing poorly, money controls the decisions."

— Bruce Anderson, partner, Welsh, Carson, Anderson and Stowe, venture capital firm

Prime, Wang both sluggish

Third-quarter results are below expectations

By Alan Alper

Citing drastically different reasons, Prime Computer, Inc. and Wang Laboratories, Inc. last week reported quarterly results that were below expectations.

Wang posted a $30 million loss in its first fiscal quarter, citing continued investment in its communications and financial services businesses and lower than expected demand for high-end, high-margin systems. Prime, pointing to the slowing international market that hurt IBM and NCR Corp.'s results, said profits fell 21% from year-earlier levels.

At Lowell, Mass.-based Wang, sluggish domestic demand contributed to a revenue increase of only 7%, to $560.9 million, during the period. In the year-earlier quarter, Wang reported earnings of $7 million, or 5 cents per share.

Dean Witter Reynolds, Inc. analyst Jay Stevens indicated that while Wang would probably break even in the next quarter, the firm's results were difficult to gauge because of continuing losses at Intecom, Inc., the private branch exchange subsidiary that Wang recently acquired in full. "In the September quarter they carried only a portion of Intecom's loss," he said. "In the December quarter they'll carry the whole loss," Stevens said.

Prime, despite record sales in the third quarter, said the results were "short of the company's plan," owing in part to softening in some international markets.

Prime posted revenue of $221.8 million, up 13% from the third quarter last year. Net earnings, however, declined to $12 million, or 25 cents per share, from $15.2 million, or 32 cents per share, a year ago.

In light of the uncertain economic and industry outlook, the firm has ended its sales force expansion, a spokesman said.

Other major vendors reporting financial results last week were as follows:

- **Stratus Computer, Inc.** Attracting

See **PRIME** page 115

IBM leans on industry partners

By Ninamary Buba Maginnis

NEWTON, Mass. — IBM will continue its strategy of working out deals with third-party vendors to fill gaps in its product line and to be a full-service provider, a top IBM executive said last week.



IBM's Berland

Big Blue will act as a general contractor with various firms that are experts in their field, according to Robert F. Berland, IBM information systems vice-president of strategy, requirements and quality assurance.

"Customers are sick of being systems integrators," Berland told the Massachusetts Computer Software Council last week. The computer giant plans to offer comprehensive hardware, software, services, marketing expertise, consultation and support. "No one in the world can provide all these services for a customer," Berland said. "This industry is crying out for a general contractor."

IBM's strategy is in line with an industry trend outlined by Baltimore-based Alex Brown & Sons, Inc. and others that predicts successful computer firms are evolving as full-service vendors.

Big Blue cannot meet customer needs alone, Berland said, stressing that IBM wants to work together with customers and the software and services industry. Yet Berland cautioned software vendors from contacting IBM with their applications.

"Do not send us PC software," he said. "If you're successful in the marketplace, we'll come after you. If you're successful in the mini or mainframe market, we'll do business with you. It's ridiculous for you to

See **IBM** page 116

INDUSTRY INSIGHT
Clinton Wilder

Maintenance mart booming

Doom and gloom still seem to prevail throughout most major segments of the computer industry. IBM and vendors in large systems hardware, minicomputers, semiconductors, micros and some software segments continue to be plagued by the slump/slowdown that has dominated headlines for at least 18 months.

But you won't find any doomsayers in the computer maintenance business. Quite the opposite.

At Frost & Sullivan, Inc.'s third annual third-party maintenance conference last week in New York, service industry guru D. R. "Mike" MacNaughton, the veteran consultant, estimated that the overall maintenance market will grow by more than 14% this year to $8 billion. MacNaughton predicted the independents will hold a 16% share this year, up from 10% just three years ago.

And everyone wants a piece of it. As MacNaughton began to read off his list of major hardware vendors that have recently entered the business, including AT&T, Digital Equipment Corp. and National Advanced Systems, Inc., he stopped and said, "The more appropriate question is, Who isn't in it?"

The independent maintenance business has come of age. Intelogic Trace, Inc. President John Hale, in looking back on the former Datapoint Corp. unit's first year as a public company, cited several reasons why he believes the industry should present attractive investment opportunities.

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Wilder is Computerworld*'s senior editor, computer industry.*

CDC goes down fighting

Charges Air Force contract is unfair

By David Bright

MINNEAPOLIS — Control Data Corp. will decide this week whether to officially protest the U.S. Air Force Military Airlift Command's (MAC) awarding of a $33 million contract to Honeywell, Inc.

Originally the only bidder, CDC is charging that the MAC lowered its requirements, thereby allowing Honeywell to win the contract with a computer system built by NEC Corp. in Japan. The MAC and Honeywell have both denied any impropriety.

Also at issue are the government's "buy American" policy and CDC's allegation that NEC offered the system for less than cost to gain a foothold in the U.S. government market.

The contract involves a DPS 90 system to be installed at Scott Air Force Base in Belleville, Ill., for flight scheduling, flight planning and weather updates. CDC, offering two 990 computer systems and a Cyber 205 supercomputer, bid approximately $43 million for the eight-year contract.

Boyd Jones, president of CDC's government systems group, claims the benchmark requirements were lowered to accommodate more than one bidder.

Jones also said CDC reduced its price to be competitive but that "Honeywell/NEC" offered a price below cost, essentially dumping the system in the hopes of gaining future

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Televideo nixes Alpha Micro buy; both look for other merger candidates

By David Bright

SANTA ANA, Calif. — Televideo Systems, Inc.'s new board of directors last week voted to cancel the company's proposed $25.6 million acquisition of Alpha Microsystems, Inc.

Alpha Micro President Richard Cortese said the firm would renew its search for a merger partner by recontacting Point 4 Data Corp. and some other earlier suitors.

The new board decided that Alpha Micro was "not an appropriate fit" for Televideo," according to Televideo Finance Director Gary Mistlin, who said that three of the board's four members resigned for personal reasons unrelated to the acquisition plans. Only K. Philip Hwang, Televideo's founder, chairman and controlling shareholder, retained his board seat.

Initially, the proposed acquisition appeared to be a good fit for both companies when Televideo emerged as a "white knight" for Alpha Micro to fend off the takeover efforts of Tustin, Calif.-based Point 4 Data [CW, Sept. 22].

With Alpha Micro, which sells multiuser supermicrocomputers to vertical markets, Televideo would have gained a new customer for its terminals and an increased distribution network. Alpha would have benefited from Televideo's greater financial resources, ability to supply terminals and its offshore manufacturing capacity.

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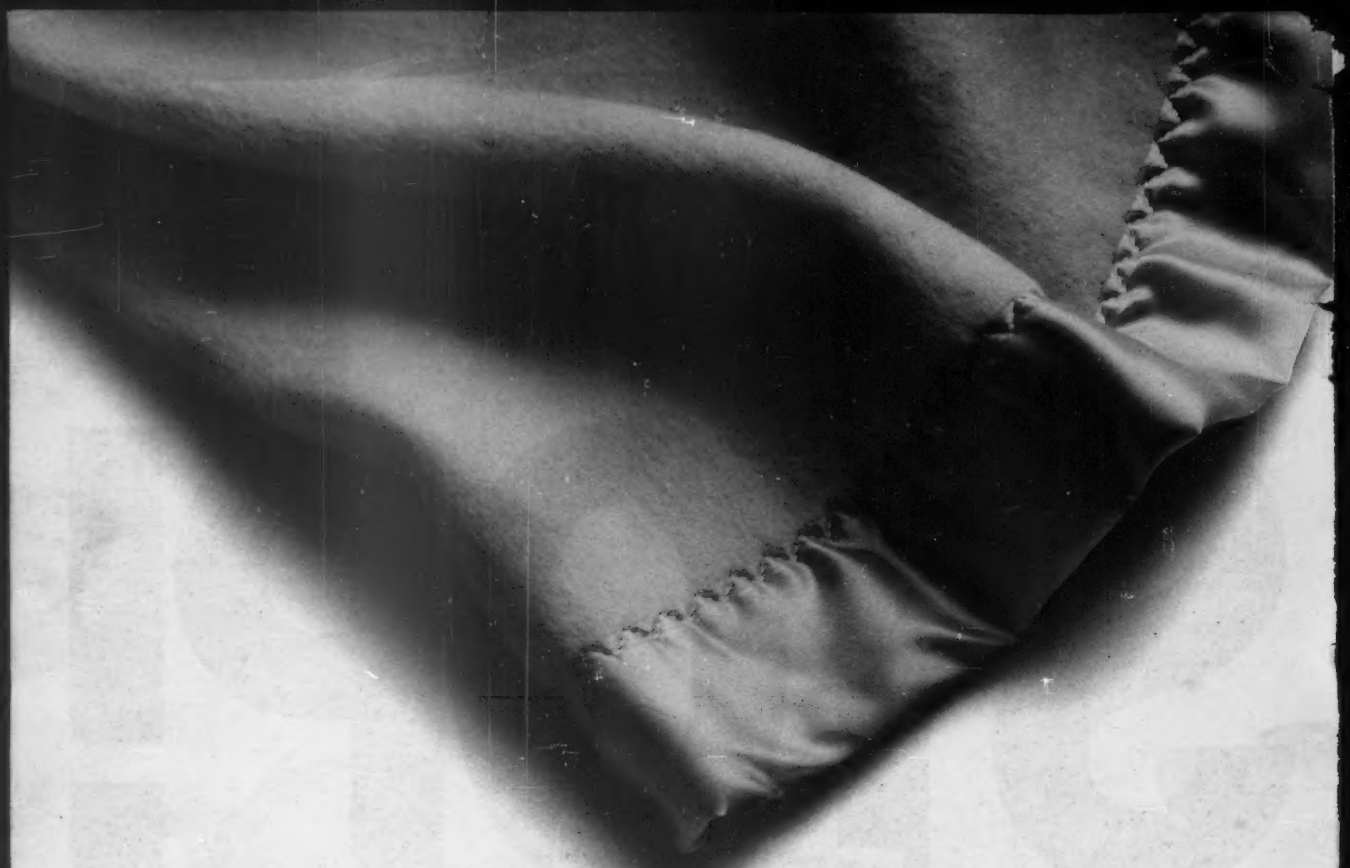
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